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ORIGINAL ARTICLES

AN ORTHODONTIC APPLIANCE, BEING A COMBINATION OF PRINCIPLES INVOLVED IN THE LINGUAL APPLI- ANCE, RIBBON ARCH AND EXPANSION ARCH

By H. C. POLLOCK, D.D.S., ST. LOUIS, Mo.

TO bend a wire to conform to the dental arch and teeth as they stand in mal-occlusion, then to gradually straighten or lengthen this wire from time to time as the teeth are moved in conformity with the wire, is a principle which in the past few years has been very much advocated and seems to have gained no small amount of popularity in the various designs of orthodontic appliances.

A slow, gentle, constant pressure made to bear continuously upon the teeth in the direction in which it is desired they should be moved, as advocated by Angle and others, has seemed to be much more desired than any form of intermittent force. Both practically and theoretically, it seems entirely agreed that this type of force applied to the teeth in orthodontic treatment must now be practiced if results are to be obtained within a reasonably short period of time and if the patient is to be released of many of the defects of former methods of orthodontic technic and treatment. Still another qualification which has seemed to be equally desirable in orthodontic appliances is that of inconspicuousness and cleanliness.

Because the appliance about to be described, seems to have qualified in a measure at least in all of the above specifications, as well as in many other characteristics of merit, I have been asked to describe it and its application in the treatment of cases.

The appliance is composed of the following members (Fig. 1): base wire (b), auxiliary wire (h), labial wire (a) as the basic members of the appliance. In addition to these, are ferrules on the auxiliary wire (g), small ligature wires or grass line (d), and loop (e) as a section of the labial wire.

The base wire (*b*) is made of a rather stiff or rigid material which will retain its rigidity after being heated, a material which can be successfully adjusted by the wire-pinching process (after Lourie). Ten per cent iridio-platinum is ideal; however, Ney Oro may be used or a number of the different precious metal combinations manufactured for orthodontic purposes. If a base metal wire is used, it must be one the temper of which is not obliterated by heating, as both ends of the base wire (*b*) are soldered to the lingual surfaces of the molar bands. The base wire (*b*) is adjusted and bent to the cast in such a way that it lies very close to the soft tissues, still allowing sufficient room under it to permit of proper cleansing process, as well as ample space and area exposed for operating the wire-pinching processes which may be desired in the molar and second bicuspid region. By joining the two molar bands as it does, the wire serves the purpose of stabilizing the whole appliance, in addition to securing

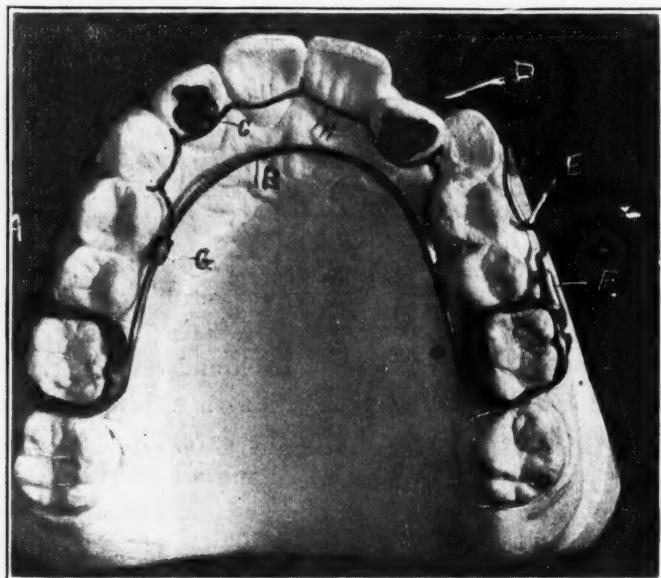


Fig. 1.—*A.* Labial wire. *B.* Base wire. *H.* Auxiliary wire. *D.* Small-ligature wire. *E.* Loop in labial wire. *F.* Buccal tube. (Appliance described in text.)

stationary anchorage of the molar or anchor teeth. The wire, of course, may be either expanded or contracted, tilted or torqued by the wire-pinching process which has previously been described by Lourie, Dewey, and Mershon and should be made of not less than 19 or more than 16 gauge Brown and Sharp. A removable attachment for securing the wire to the molar bands is not required, as the bulk of the adjustment comes from the labial wire.

The auxiliary wire (*h*) is a very soft, flexible, annealed wire which may be easily and readily adapted to the lingual surfaces of the teeth; in fact, burnished to the teeth on a plaster cast if so desired. I use a soft gold alloy wire; however, annealed nickel silver or base metal wire might be successfully employed for the same purpose, if it were not for its extremely corrosive and unclean properties in the mouth. One end of this auxiliary wire (*h*) should be securely soldered to the base wire (*b*) as in Fig. 1, while the opposite end is attached to a ferrule, which in turn slides easily on the base wire (*b*). The fer-

rule sliding easily on the base wire (*b*) enables wire (*h*) to be free to follow the teeth in any direction or position they may be moved. In order to make the auxiliary wire (*h*) secure from upward and downward movements in the front of the mouth, two small bands may be placed on the anterior teeth, as desired, with lugs or spurs on their lingual surfaces, which spurs will hold securely the auxiliary wire in any position required.

If it is desired to eliminate the conspicuous appearance of the anterior bands, the same effect may be secured by the use of copper cement on the lingual surfaces of the teeth, the cement notched exactly to retain the auxiliary wire, thus serving the same purpose successfully as if the teeth were banded. It has been my custom to use gelatin strips, tightly drawn about the tooth, after the soft copper cement has been placed upon the lingual surface. This enables the cement to set securely without being distorted. It then becomes amply rigid and secure to retain its grip on the lingual surface of the tooth indefinitely. This latter



Fig. 2.—Same as Fig. 1. Appliance adjusted to a lower arch.

process assists to eliminate some of the criticisms of copper cement when used for spurs and lugs.

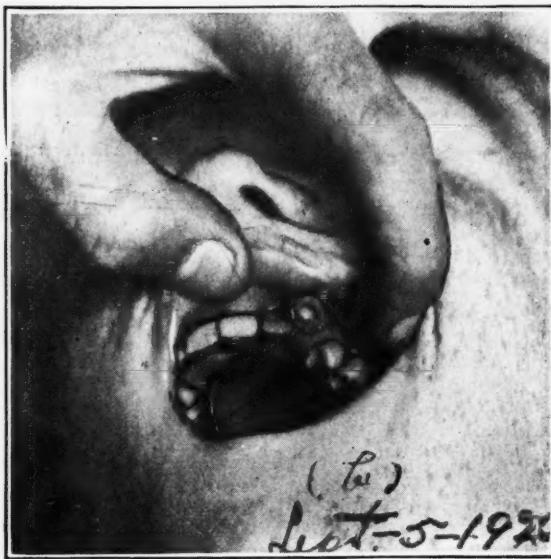
The labial wire (*a*) is the usual form of loop labial wire; however, if made of rigid material, it can be used successfully in gauges as small as 20 or 21 B. & S. The mesio-distal adjustment is manipulated entirely by means of the lengthening and shortening of the loop springs. The buccal tubes engage each end of the labial wire, which, when well fitted and in place, make of it a long flexible spring wire, being an ideal means of securing pressure to apply to the teeth. The labial wire (*a*) may or may not be secured by means of attachment to the anterior teeth, depending entirely upon the movement to be desired and the preference of the operator. By making secure attachment to the bands on the anterior teeth, however, some of the advantages of the root-moving forms of appliances may be secured. The molar or anchor teeth may be tipped by manipulation of the labial wire in conjunction with the pinching of the base wire, in order to secure opening of the bite, as may be desired.

By means of ligating wire *a* to auxiliary wire *h*, pressure may be gained against the lingual surfaces of the teeth at any point or region. Inasmuch as the labial wire is a flexible spring wire, the ligature may be placed about it rea-

sonably tight, and the pressure will then be exerted constantly against the teeth by means of the auxiliary wire *h* until the teeth move sufficiently to release the pressure. Another advantage is the use of ligatures. The ligature is not placed about or around the tooth, but, instead, passes between the teeth through the embrasure. This method eliminates many of the objectionable features to a



A



B

Fig. 3.—(A) Appliance adjusted June 5, 1920. (B) September 5, 1920. Appliance operating during the greater part of July and also of August without adjustment.

ligature wire or grass line, particularly as the ligatures do not come off and are not constantly manipulated by the finger of the patient, in this way coming loose and causing annoyance and difficulties. Ligatures of rubber may also be employed—a matter of preference to the operator.

Plain anchor bands are used, being made of a strong and substantial band material. Much care should be taken in the construction of molar bands, they must be strong and durable, and able to withstand the stress of mastication over a period of time, as they are a part of the unit appliance. The appliance is made entirely on the model, impressions being taken with the molar bands fitted to the teeth in the mouth, impression removed, and the molar bands then transferred to the impression and waxed into their proper positions.

Fig. 2 shows the appliance fitted to the lower arch with auxiliary wire closely adapted to the teeth. The most outstanding feature of this appliance is its constant perseverance in moving teeth without frequent adjustment and also the rapidity with which teeth can be made to assume their normal relations in the arch, as the force is constant and not intermittent.

In cases of canine teeth in labial occlusion, it may be desired sometimes to

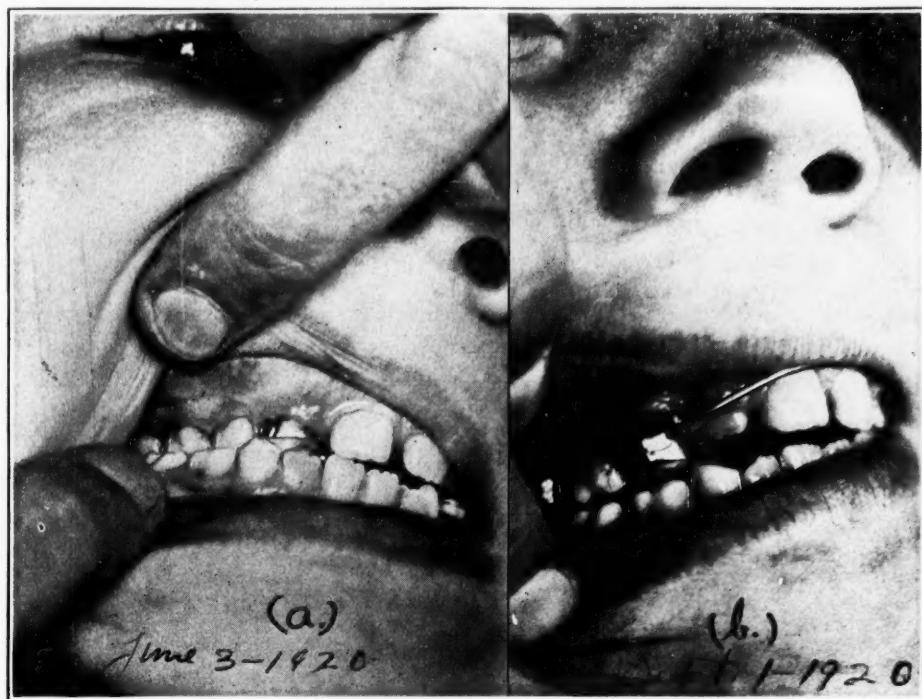


Fig. 4.—(a) June 3, 1920. (b) On September 1, 1920. Appliance receiving two adjustments after being set to place. Case not in normal occlusion as yet, but entirely shifted over the lower teeth.

shift the adjustment loops in the labial wire from the usual position, just in front of the buccal tubes, to a point just over the canine, thus enabling the loop to bring pressure upon the prominent canine tooth. In all cases where it is urgent to use a Baker anchorage, hooks and attachments for the convenience of placing the rubber bands may be placed just the same as with any other appliance. The Baker anchorage, however, adds to the rapidity of tooth movement as a result of the added energy transmitted by the elastics.

In order to illustrate the question of efficiency, a recent case is presented as it appeared June 1, 1920 (Fig. 3). Appliances were immediately set to place and after several adjustments the patient left for the summer months. The patient next appeared September 5th when the photograph shown in Fig. 4 was

taken. This illustrates the progress of the appliance in providing space for the malposed canine. Ample space was provided by September 5th, but as the appliance received no adjustments during the summer months, no pressure had been brought to bear in order to bring the canine into its proper occlusion or in the downward directions.

Fig. 4-A shows a case as it appeared June 3, 1920; Fig. 4-B, September 1, 1920. All of upper buccal teeth on the right side were originally in lingual oc-



Fig. 5.—Appliance in place.

clusion. By placing a small amount of lateral tension in the labial arch wire, at the same time attaching auxiliary lingual wire to the arch wire by means of a wire ligature at a point immediately anterior to the deciduous canine, pressure was made to bear constantly upon this side which soon shifted the side as shown in Fig. 4-B, patient making two visits for adjustment after appliance was set to place.

Another type of case is shown in Fig. 5, in which tremendous expansion of the upper dental arch is desired. I have found the type of appliance used in this case to be the most effective, because the force extended is constant and at the same time gentle, stimulating bone growth very rapidly.

A SUBSTITUTE FOR PRECIOUS METALS IN THE ENLARGEMENT OF THE ALVEOLAR PROCESS BY THE LINGUAL WIRE

BY DR. R. ANEMA, PARIS, FRANCE

THE accompanying illustration shows a wire nipped and indented by means of Lourie's wire-stretching pliers. I have used the wire for enlarging the inferior alveolar process of an eight-year-old boy. The special feature of the wire is that it is made neither of iridio-platinum, nor of elastic gold, but of the nonprecious metal nichrom. It may also be made of hard German silver. If I

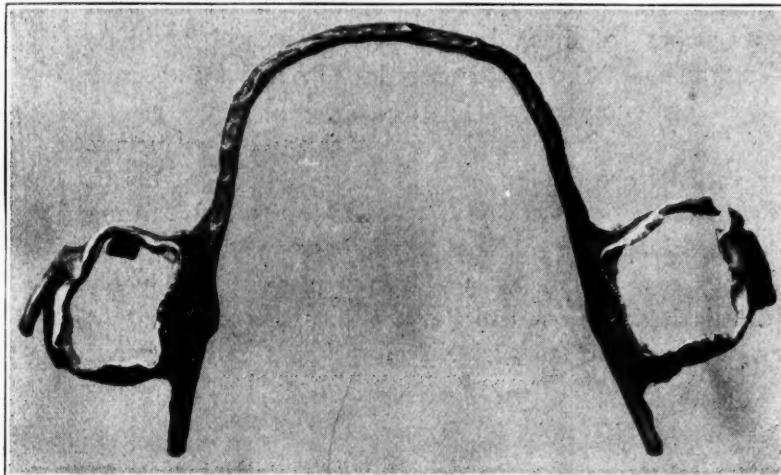


Fig. 1.—Lingual arch (twice natural size) of nichrom soldered to the bands by pure tin and stretched by means of Lourie's wire stretching pliers. This wire produced an expansion in the canine and incisor region of about three millimeters.

am not mistaken, it was Case who first gave the profession a means of obtaining very hard German silver by drawing it cold through the draw plate.

Instead of soldering the wire with silver or gold, which would diminish its elasticity, I soldered it with tin and in this way was able to maintain the elasticity unimpaired. As a matter of fact, soldering with tin, if carefully done, does not lessen the elasticity of the wire, as Angle already demonstrated in soldering his "arch hooks" to the alignment wire made of nickel silver. The tin soldering must, of course, be carried out with all requisite precautions to cleanliness, care being taken to give a certain thickness to the tin solder, or even pure tin, that may be used, though the latter requires a higher temperature. A considerable mass of tin solder or tin must be used, otherwise on nipping the wire with the pliers, it may become detached from the band.

The wire shown in the illustration has been indented in some twenty places and I was able to enlarge the alveolar process in the region of the canines and incisors by about three millimeters. The case in question is one that falls in Class II, Division 1 (Angle's classification).

The use of nonprecious metal for the wire employed in the enlargement of the alveolar process by Lourie's method is of considerable importance at the present time in France owing to the fact that iridio-platinum now (May, 1920) costs sixty francs a gram.

I should like to conclude this brief technical description by offering a suggestion of a general nature. Could not the "nouveaux riches" both in Europe and in America be urged to insist less on having their jewels mounted in platinum!—for no doubt you have as many "new-rich" in America as we have on this side of the Atlantic. I remember that during my first visit to the United States some twenty years ago I was somewhat surprised to hear a negro insist on having a perfectly sound tooth replaced by an all gold crown. The negro, doubtless a "nouveau riche" of those days, wanted to have gold in his mouth just like his white brother. He could not be made to understand that gold had been used for the white man's teeth not through luxury but of necessity. May the "nouveaux riches" of these days, in Europe as well as in America, show a clearer understanding of their after-war duty by leaving platinum for the more urgent needs of orthodontists and dentists.

Owing to the exceedingly high cost of the precious metals at the present (not all our patients are millionaires), I thought it might be of interest to the reader of *THE INTERNATIONAL JOURNAL OF ORTHODONTIA*, to mention a method of using a nonprecious wire soldered to the bands with tin, which I have found useful in various cases. Tin, as is well known, causes no inconvenience in the mouth, neither is it detrimental to the health. It is true that it slightly discolors the surrounding teeth, but such discoloration is easily removed.

ARRESTED VERTICAL DEVELOPMENT

BY DR. ROBERT DUNN, SAN FRANCISCO, CAL.

IN the course of the preparation of this paper it became quite evident that the subject of Arrested Vertical Development was of such magnitude, being associated, as it is, to a greater or less degree, with almost all cases of malocclusion of the teeth, that a more extensive knowledge of the subject of anthropology and biology was necessary than the limited time and available material at my disposal would permit.

Therefore to present the matter for your consideration at this time in little more than, may I say, a tentative way, would be a mistake, and I will defer the more thorough or analytical treatment of the subject to some future time or until the obtaining of necessary material will be less difficult.

In using the term "Arrested Vertical Development" I refer to the conditions found in the molar and premolar regions, that produce what is commonly known as an excessive overbite. For the present at least, we will divide arrested vertical development into three classes:

1. Arrested vertical development in molar and premolar region, associated with the great class of irregularity of teeth known as Class I. It is here the condition frequently exists only to a minor degree, and when such is the case, it is usually overlooked, resulting in much embarrassment to the operator.

2. Class II arrested vertical development in molar and premolar region, associated with that type of irregularity known as Division 1, Class II. Here it is easily recognized, often existing in the extreme, and not infrequently unconquerable.

3. Arrested vertical development in molar and premolar region associated with that type of irregularity known as Division 2, Class II. Here the condition, as in Division 1, Class II, is easily recognized, differing from that found in other types of classification in that it is more easily controlled.

In looking through the mass of orthodontia literature it became quite plain that arrested vertical development in the molar and premolar region, as a vital factor in producing malocclusion of the teeth, has not fully dawned upon the orthodontia profession, and in the failure to recognize this all-important factor and what constitutes normal vertical development in a given case, lies the cause of a very large percentage of that great number of failures that confront the profession.

Pullen of Buffalo, in his article, "Control of the Over-bite of Class II Cases," read before the Panama Pacific Dental Congress, places considerable emphasis upon its importance, and states, "All too often have cases of malocclusion been treated in which the abnormal vertical overbite has been overlooked or regarded as an irremediable typal defect with the result that the most important factor of

*Read before the Pacific Coast Society of Orthodontists, San Francisco, Cal., Feb. 16, 1920.

the malocclusion has remained untreated," and may I add, more frequently have cases been treated wherein the orthodontist believes he has overcome such discrepancies which may have existed as to the proper vertical development, but which in reality, he has not, and later, when the teeth begin to revert somewhat to their former malposition, he places, for the want of a better reason, the cause of the reversion, upon the influence of the developing unerupted or erupting molars. More particularly is this true in cases of Class II.

The questions that present themselves most forcibly as to the subject are: What is the cause, and how are we to determine what is the normal vertical development in molar and premolar region in a given case? What is the most effective way to establish the normal vertical condition when absent; and the all-important, how are we to maintain this vertical rearrangement when once obtained, resisting those forces of occlusion that tend to cause a reversion to former conditions before nature can produce that development necessary for its permanent maintenance?

As to the etiology, that still remains a little obscure, everything pointing, however, to the lack of proper extrinsic stimuli rather than to any intrinsic stimuli, and it is the belief of the writer, that it will, on a more thorough investigation and analysis, be found that arrested vertical development is not a result of factors usually attributed as causes of malocclusion of the teeth, but it is in itself a most potent factor, the various types of malocclusions taking their form through the influence of contributing factors, many of which are but perverted normal forces acting as such because of the arrested vertical development.

How are we to determine what is the proper vertical development in a given case? This like the former question, is not yet definitely settled. Bonwell and others state that the normal overbite in incisor and cupid region is governed by the depth of cusps of molars and premolars, the length of cusps varying in different types of individuals. This rule, while probably efficacious in the making of artificial dentures, will not, I believe, be found sufficiently practical for the determining of just what is the proper overbite in cases we are called upon to treat, and must be either enlarged upon, or some other means evolved for its determination. In the meantime the best that we can do is to endeavor to establish through mechanical appliances such vertical rearrangement as in our opinion will approximate the normal, then select such retaining appliances as will, with occasional changes, permit nature to adjust any slight discrepancy that may then exist.

If in the use of engineering principles or other methods of predetermining arch form, this vertical development in molar and premolar, is not fully considered and provided for, such principles or methods will be of little practical value. For it is by utilizing variations in this development as well as changes in arch form that enables nature to adopt one particular type or form of tooth to the various types of individuals.

Dr. James McCoy, in his paper on "Predetermination of Arch Form" read before this Society at its last meeting, demonstrated conclusively that nature can and does select one size of type of tooth and adapt it in harmony to a wide

variation in type of individuals; not through the forming of the arch alone, as some believe, but mainly through changes in vertical arrangement.

This now brings us to the question as to the most effective way in establishing and maintaining normal vertical development. In those extreme cases, where the deciduous teeth are still intact, even where the permanent incisors are in a partially erupted stage and the first permanent molars have not as yet erupted to full occlusal contact, the crowning of the deciduous molars has, in the writers experience, proved quite effective. It is assumed, of course, that the absorption of the deciduous molar roots has not progressed to the extent that this procedure would be impracticable.

Care must be exercised in seeing that the so-called "opening of the bite" is done gradually, for in those cases where this was not observed and the bite or occlusion was opened to the full extent desired all at one time, there apparently occurred an overstimulation in the deciduous molar region, resulting in a retarding of vertical development and the eruption of permanent premolars, extending over an unusually long period of time.

This gradual change is best brought about by first crowning the lower first deciduous molars, using material of about thirty to thirty-one guage. Then after the lapse of several months or longer, the upper deciduous molars may likewise be crowned, following still later, if this is not sufficient, by either making new crowns for the lower, with thicker cusps, or carefully removing the old ones and recementing, using sufficient cement to permit of the crown being replaced to a position a little more elevated than formerly. These crowns should be permitted to remain during the period of retention of the deciduous molars. If desired, regulating appliances may be attached to the crowns, *but in no case must the first permanent molars be used at this stage, in these particular cases, as an anchorage for appliance, for to do so would only mean a counteraction to that desired.*

In cases where the eruption of the permanent teeth is further advanced, it is quite obvious that the molars and premolars (if the latter have erupted) must be elevated. This will necessitate the use of the permanent incisors and cuspids, when the latter are in position, as a resisting force. As we have the forces of occlusion to combat as well as such resistance as the molars and premolars in themselves will exert, it will readily be seen that there will be a considerable displacement of the incisors unless we have those teeth, and molars as well, under complete control.

The selection of an appliance in the treatment of these particular cases that will permit of this control is most essential and I know of none that will fill the requirement so well as the ribbon arch appliance. In the process of elevating the molars and premolars the incisors and cuspids will be depressed in their sockets; this is unavoidable, in fact, it is desirable, for these teeth will invariably return to their former vertical positions, which is usually normal, and it is the utilizing of this force of the returning teeth that will prove so beneficial in the stimulating and stabilizing of normal vertical development in the molar and premolar region. With this requirement in mind, it will be seen that the selection of effective retainers is as important, if not more important, than the selection of suitable regulating appliances.

After many years of experience in the use of various principles in retaining appliances, as bite plates, incline planes, lingual arches with skeleton incline planes attached, etc., I have come back to the use, after retrials and discards, but with some refinements in construction, to the lingual incline plane as evolved by Rogers of Boston. Great care must be observed as to the details in the construction of this appliance, for if this is not done, it may prove more of a menace than a benefit. At no time must it be depended upon to maintain mesio-distal relation of the arches. Where this latter condition has been a feature of the case, that must be developed and maintained through the labial arch and intermaxillary ligatures. This is very important, for intermaxillary ligatures must not be attached to the incisor bands, or for that matter, directly to any of the upper teeth. The width of the inclined plane should be only sufficient to easily engage lower incisors, bulk being avoided, as it only serves to interfere with the speech and proper prophylaxis. This little retaining appliance, if intelligently constructed and worn for a sufficient length of time, will help very materially in bringing to a successful conclusion many trying cases.

DISCUSSION

Dr. B. Frank Gray, San Francisco, Cal.—Dr. Dunn has written on a subject which has interested me for a good many years. It seems to me we paid little attention to this matter of the so-called vertical "overbite" or lack of vertical development in the early days of the specialty of orthodontia. I recall in the treatment of certain Division 1, Class II cases of malocclusion where the supra-occlusion in the incisor region was marked that presently during the course of the treatment this condition was greatly reduced. Of course, the use of the intermaxillary elastics had a tendency to stimulate the vertical development of the molars—particularly the lower first molars in such cases.

I quite agree with Dr. Dunn that even to this day this condition is frequently overlooked; at least there is far too little attention paid to it. Certainly I would expect nothing but failure in the treatment of many cases if I did not bring about an increase of vertical development in the premolar and molar region. The doctor makes a good point in suggesting the arrested vertical development "is not a result of factors usually attributed as causes of malocclusion of the teeth but is in itself a most potent factor" in the cause of malocclusion. I believe there can be no doubt of the truth of that statement. We are dealing in many cases with a real cause of malocclusion, therefore, and should direct our efforts to the overcoming of this condition.

Intermaxillary elastics, vulcanite bite-plates, the bite-plates soldered to incisor bands, the lingual arch carrying bite-plates, the ribbon arch mechanism, crowning of deciduous molars—all of these and more have been used to bring about the correction of this lack of vertical development in the premolar and molar region. I think I have tried pretty nearly all the methods noted with varying success. I am glad to say that I have never had more splendid results than in some cases where the Angle ribbon arch has been used. In treating some of the younger children it seems to me a very nice appliance is the removable lingual arch to which has been soldered a suitable plane or plate for receiving the impact of the lower incisors. If desired an additional support may be had through the use of bands on the incisors or the long spurs to engage the cutting edge of these teeth.

I am sure Dr. Dunn is not overcautious in the matter of opening the bite gradually. It must be realized that through haste we can defeat the object sought, causing possibly the premature absorption of the roots of the deciduous molars in cases where they have been banded or crowned.

Dr. J. V. Mershon, Philadelphia, Pa.—In Philadelphia we had an old judge who said some men talked a couple of hours about something they knew nothing of, and his limit was a half hour. I am afraid my limit is less than half. I do not know much about this

subject. I agree with Dr. Gray that the profession has noticed it and has not had the courage to tackle it. I am glad Dr. Dunn has considered this matter of a lack of vertical development. It is a developmental problem. There is no use of going into the question of whether we all noticed it or not. We cannot help noticing the thing that gives as much trouble as this failure of vertical development of the molar teeth. Really whether it is a lack of development in the distal region or overdevelopment in the anterior region I do not know, and do not know how to find out, but we know there is that lack of symmetry there, and again we know that in undertaking to treat this condition no two cases are alike. Some come along beautifully, and others, baffle us in spite of all our ingenuity. But again our correction is the result of a process of stimulation and again I want to call your attention to a difference I shall try to make, and do not know how to do it! I am not sufficiently skillful in the use of words to be able clearly to differentiate as between a stimulus and a force. Now whether we can have a stimulus without force, I do not know. But all stimuli are not mechanical stimuli. We can have a chemical stimulus. We may have a stimulus from heat, from cold, and in many other ways. I do not know whether you have all looked through a microscope, and in the center of the field have seen a single cell animal, swimming about over the field, and then over here on your glass you place a little drop of iodine and it creeps over and over, and the motions of the animal become more jerky and rapid, and then it slows up and is dead! There is the result of a stimulus to a single cell. At first the stimulus increases the activity (the mechanical reaction of the iodine) of the cell, but it becomes over stimulated and finally dies. If you put your foot on the same animal on a hard floor it would be a stimulus, but it would cause instant death of the animal. In moving teeth, all we want is that stimulus. Quoting from Conklin, as I read in my paper, in treating our cases protoplasm has that peculiar quality of receiving this stimulus and storing it up for a long time and reacting for a long time. The point I wish to emphasize is, beware of too much pressure on your teeth.

Coming back to this problem of—to use a vulgar term—"opening the bite" my experience has probably been the same as that of everyone else. If anyone can show me any way I have not tried I would like to see it, and I have failed with all of the methods. But I believe it is a physiological condition and not a mechanical condition we are trying to overcome. My procedure in a large percentage of my own cases is first to produce what we call harmony in the size of the dental arches. I forget the overbite. I treat certain Class II cases as Class I cases—disregarding everything except—the general arch formation. We are producing a stimulus to those teeth. There is always an effort on the part of nature to revert to the original plan, and it is astonishing that in a reasonable percentage of those cases we get that vertical development. Not in all of them, but in a lot of them. One child will develop at eighteen, where another takes longer. Again, we are not good waiters!

In a Class I case in which the upper teeth were markedly protruded, with abnormal lip function—the lower arch very symmetrical (the change being made by the uppers being moved out entirely) with lower teeth biting up against the soft tissues,—contrary to my best judgment I simply put on a labial arch such as Lourie uses, with the fingers coming down to restore the anterior teeth and overcome the abnormal function of the lip, and to my surprise that was all that was required. I had the courage of my convictions and waited for two years and have not touched the case since.

So it seems to be a question of stimuli, irrespective of our methods. Sometimes the stimulus of expansion or general correction which largely is in the bicuspid and cuspid region—is sufficient.

In Dr. Johnston's article in the November *Dental Cosmos* where he recorded the effect of the involuntary tongue muscles, he has shown a certain type of case in which he has never been able to secure retention. He has not come to any conclusions, but simply states facts. I hope that article may be of some assistance in our troubles. But whether it is a lack of vertical development, or whatever it is, it is all a matter of development, and we have the same trouble in retaining our cases.

Dr. Cavanagh, Portland, Oregon.—It seems to me that in the application of force to the crowns of those temporary molars to "open the bite" we are apt to get stimulation where we

do not want it; or we may get depression there by putting all the force of mastication on those molars.

In the use of the bite-plate attached to the anterior teeth (to which I have resorted to quite an extent) may we not get sufficient stimulation to cause an abnormal absorption of tissue in the region of the lower incisors? An overstimulation, in my belief, is as detrimental—and more so—than an understimulation. The problem of getting the right amount of stimulation to produce just the proper result is a very touchy one. I have caused absorption in the process of the lower anterior teeth by the use of the bite plate, placing all the strain on the anterior teeth and awaiting the development that must take place in the molar region while the first molar is erupting. I had the idea that if I retained those anterior teeth in the manner which I think is approximately right, until those permanent molars have erupted fully, probably the removal then of my bite-plate should permit the bicuspids to erupt to their full length (as we may say). I have been disappointed in some cases, as on removing the bite-plate there was a return of the abnormal overbite—either that or a resorption in the region of the molars or premolars. I think we have not given enough thought to these matters to make definite statements. I have seen the results of crowns on temporary molars, left for a year or more, and the result was just as unsatisfactory. I can offer no satisfactory solution.

Dr. Scott, San Francisco.—What I will have to say is more the result of observation than of experience. You have noticed that in the deciduous arches before the permanent teeth are in place, the arch is practically a horizontal, flat plane. I think that accounts for the fact these cases are very apt to appear normal in development at the age of three or four, and this plane being flat, it is very easy for the teeth to drift into distal occlusion—Class II, or mesial occlusion Class III. Nature has provided a way to develop the compensating curve. I think it is done in this way. In the ordinary circumstances, the lower first molars erupt about the age of six years, and the lower one almost invariably takes its position first. You still have, to all intents and purposes, a flat plane, but when the bicuspids erupt, they erupt with enough force—enough stimulus, to lift the deciduous molars from their normal positions, which allows an additional space occlusally between the two permanent molars (upper and lower.) Now these permanent molars will erupt additionally until they come in contact with one another—which opens the bite, and there your vertical development takes place in a normal case. That is the result of my observation. I have not read it or seen it in print. I think that is the way Nature brings about the development of the Curve of Spee. In the Forsyth Infirmary in the examination of forty thousand children, 95 per cent of the children at the age of three years are developing normally from the dental standpoint. In all probability some of them are not developing normally, abnormalities likely being overlooked. At the age of twelve, 95 per cent of them were abnormal. Any-way, according to their data, all of our trouble occurs between the age of three and twelve years.

Dr. James D. McCoy, Los Angeles, Cal.—Those of us attending the meeting of the San Francisco District Dental Society the other night were interested in the report of Dr. Alvarez concerning rickets, etc., and diseases characterized by faulty bone formation. According to a report read by the Doctor, the factor of exercise seemed to play an important part. Children brought up under improper conditions in the cities seemed to develop rickets, or other troubles. Those living in the country, where given an abundance of fresh air and exercise, seemed less predisposed to this trouble. His mention of the fact that this condition was least prevalent in Australia, had an important bearing when we consider that Australia is a ranching country. It is not an empire of cities, but a great agricultural country.

When we stop to consider the question of vertical development, it seems to me the factor of normal use and dis-use must play an important part. I believe if we place the teeth in their normal relation, where they can function—if we have used the proper means—this will cease to be the great problem that it has been in the past. I think we all realize we must in the future consider mechanical force with a great deal more caution than in the past, so that we may classify the means of moving teeth as (1) developmental force

or a physiologic force applied to the teeth (2) a traumatic force—i.e., a force which would result in overstimulation where teeth are moved too rapidly. If we can move all the teeth to approximately normal relation by mechanical means of such character that it will constitute a physiologic process, I believe under that stimulation, and on the restoration of the teeth to positions, where they may receive the stimulation of other functions which they would naturally get—that under such conditions this will cease to be as great a problem as at present.

I was interested in talking with Dr. Gilpatrick, whose method of arch determination you will remember. His method is based on placing the teeth in the arch in such manner they will be able to perform all the motions of occlusion—his methods being similar to those of the prosthodontist. He made the statement that in creating such an arch, where all the acts of occlusion can be performed, "I find the question of lack of vertical development has ceased to be as great a factor as it used to be." I think that is worthy of our careful thought.

Dr. McCowan, Palo Alto, Cal.—I am very glad the meeting has taken this turn because I think we have had practically all the different appliances. I believe we have enough appliances with which to do the work, if it has to be done. The principal thing is to get patients in the proper physical condition. Proper exercises, proper food and let us get these little patients nourished so they can profit by the work we are doing for them. I was for a number of years, in gymnasium work, and saw the benefits of getting little patients in good physical condition. Many of these troubles, spinal curvature, etc., are cured by proper muscular exercises. So by toning up the muscles of the face, putting the children in good physical condition, we correct or help many of these troubles. I believe it is proper to widen the arches and then do what we can to put the child in good physical condition. That work is neglected to a great extent, but if we would advise the treatment of these children in that way it would help a great deal.

Dr. Moorehouse, Spokane, Wash.—I was very glad to hear Dr. Dunn's paper. I feel we have a wrong impression, and have been making a wrong diagnosis of this so-called overbite calling it a lack of vertical development. I say this after observing Dr. Ketcham's method of treatment, and from my own success. Some practice the method of depressing the incisors—especially the upper ones, to overcome this overbite, feeling the condition is due to an overdevelopment of the premaxillary bones rather than an underdeveloped condition of the alveolar process in the region of the molars and bicuspids. I do not know if I grasped just what Dr. McCoy said as to the prosthetic phase, but I have followed this principle in treatment—especially in Class II, Division 1 cases. I study the facial appearance of the patient. We see lots of people with artificial dentures and it is obvious the teeth were set too short: the lips close down together in a manner that shows unpleasing outlines. In many cases of malocclusion you will observe a lack of development in the molar and premolar region, which means you must have a stimulation and development of that region, and a strictly open-bite treatment. But if you find when the lips are perfectly passive and they show none of that open appearance, the question then is one of overdevelopment in the premaxillary region, or possibly both in the premaxillary region and in the alveolar region of the lower incisors, which indicates the depression of the incisors of one or both arches.

I think we have overestimated the idea of atmospheric pressure from a mechanical standpoint. So far as the proper treatment is concerned, I think there are two considerations: the proper development and proper holding of the muscles of the face and of mastication. And I would add to that the proper oxygenation of the blood where you get food for the development or growth of any tissue—and that is necessary in the development of any part of the body—not alone the jaws. If it helps all parts of the body it is not simply atmospheric pressure assisting the jaws.

Dr. Reed, Long Beach, Cal.—As to Class II, Division 1 cases, we not only fail to have sufficient development of the alveolar process, but also of the superior maxillary bone. In expansion we produce lateral development of the maxillary bone and increase the sinus development. Not only that, but in getting our lateral development, I think we stimulate

growth and get downward development of the superior maxillary bone. Frequently where these cases are long neglected, we have a deflection of the septum, while if corrected earlier we get that downward growth and the septum is allowed to straighten out.

Dr. Robert Dunn, (closing discussion).—I am satisfied I have created some disturbance anyhow! I still maintain that arrested vertical development has a great deal to do in producing many cases of irregularity of teeth. We do not always recognize it, however, and as Dr. Mershon says, we may have established a sufficient degree of that development in some instances where it existed and do not know it! I also maintain that the incisors are almost always normal as to vertical development. There are exceptions, of course, but in a large percentage of cases they are normal and when depressing them you would have to hold them a mighty long time after treatment if you do not expect them to go back to their normal position.

This thing of depending upon children of today to follow out muscular exercises in the hope of establishing normal vertical development in molar and premolar region is all talk and foolishness. True, proper muscular exercise may have a great deal of influence, but that work must be started very early in life to be of much benefit.

As to the use of small crowns, you will notice I stated you must be very careful in their use and not "open the bite" too rapidly. Use them as a stimulus. The purpose of the deciduous teeth is not only the mastication of food, but for the stimulation of the growth of the first permanent molars and the premolars that are to follow, and if you will observe this development through the aid of the x-ray you will note this growth taking place from year to year and such observation may be of value. What we want to do is to stimulate the condition through the use of these little crowns, but if you get too much force you are liable to produce just what you are trying to overcome. I do not think the first molar at any time acts as a force to open the bite.

THE DENTAL HYGIENIST IN ORTHODONTIC PRACTICE

By H. B. HAMILTON, D.D.S., ITHACA, NEW YORK

DISCUSSING a paper on Oral Prophylaxis by Dr. Nelson at the St. Louis meeting of this Society the writer mentioned the use of the dental hygienist in his practice. A number of the members afterward made inquiries about the hygienist and evinced considerable interest in this aid to our work. The interest then shown is the excuse for this paper.

Ever since orthodontia became a specialty of dentistry there has been more or less controversy between the dentist and the orthodontist as to the effect on the teeth by the wearing of appliances. The dentist has blamed all sorts of injuries to both hard and soft tissues to the wearing of appliances. The orthodontist has claimed that proper appliances can cause no injury.

The orthodontic appliances in themselves, if properly designed, constructed and applied, and with the proper care, can cause no injury, but if any of these factors are at fault, there is undoubtedly danger to the oral tissues.

On the other hand, the orthodontist is constantly finding cavities and imperfections that the dentist overlooks. Unless these are cared for before the orthodontic work is begun, they may later be attributed to the appliance.

We also find the greatest difference in tooth structure and its liability to damage. In some mouths there seems to be almost a complete immunity to caries, while in others it will show evidence on the slightest provocation. There is also the greatest difference in the care which the patient gives to his teeth. Some patients are able to keep their teeth absolutely clean no matter how crude or complicated the appliance is, while others seem unable to keep them in a state that can be said to approach cleanliness, even without appliances. Instruction and continual lecturing will not entirely overcome this fault in all cases.

Before starting a case the mouth should be placed in the best of condition by the family dentist. With the placing of appliances the responsibility for the mouth rests largely on the orthodontist. Prophylactic treatment seems to be the best method of meeting this responsibility. To do this work oneself becomes burdensome, and as the great majority of our patients are school children, it is not always possible to give every patient the prophylactic attention that may be needed, and make necessary adjustments in the appliances for all the patients that have to be cared for out of school hours. It is here that the dental hygienist is of the greatest value, not only in relieving us of this burdensome task, but what is more important in conserving our time.

A dental hygienist is a person licensed by the state to remove stains and accretions from the exposed surfaces of the teeth under the supervision of a practitioner of dentistry, and to teach oral hygiene. The chief effort of the hygienist is to make the teeth clean and to instruct the patient so that he will

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maintain them in a cleanly condition. It is not necessary to go into the technic, but sufficient to say that the hygienist will do this work more thoroughly and efficiently than the average dentist.

Neither is it necessary to go into the subject of the training of the hygienist as the movement is now so well known in the dental profession. It may be said that the course is certainly thorough and that the student gets a large amount of practical experience. The various institutions teaching dental hygienists have orthodontic clinics and it should be and probably is easy for the student to get some actual experience with orthodontic practice. The following quotations from letters from the heads of some of these institutions show that they are alive to the possibilities.

"We give them talks on the need and value of their services to the orthodontist."

"The dental hygienist receives theoretical and practical training in the handling of children, the importance of child hygiene and the effect of any oral abnormality upon the health of the child."

"The dental hygienist receives intensive training in oral prophylaxis."

"She is also instructed as to how to teach children to keep their mouths clean and can give them wash bowl demonstrations in the office."

"She receives lectures in dental anatomy, and in the tooth morphology class must carve a complete set of teeth by hand."

"Lectures on occlusion and malocclusion are given."

"She is given instruction in making and separating models, cleaning appliances and in thorough prophylaxis of the mouths of orthodontic cases."

That this instruction is bearing fruit is proved by the fact that I have had several cases referred to me by our local school hygienist when the family dentist had been negligent or overlooked the malocclusion.

In addition to instruction noted in the above quotations, the hygienist is taught to make an examination of the mouth, to note all defects and abnormalities, and to properly chart such deficiencies. She also receives instruction in x-ray work: something of the machine, the technic of taking the picture, the developing and printing.

In our practice after the preliminary arrangements are made the child is turned over to the hygienist to prepare for the taking of impressions. She takes the child and seats him in the chair and while explaining the procedure endeavors to interest him and gain his confidence. The orthodontist may be able to do this just as successfully as the hygienist, but the latter is oftentimes able to accomplish this quicker and more effectively because a child will usually respond quicker to the efforts of a woman.

Before the bands are fitted and cemented the hygienist can remove the separating wires and thoroughly cleanse the teeth to be banded and the adjoining teeth. Before the appliances are put on she should thoroughly cleanse all of the teeth. After the appliances are in place she should teach the child how to care for the teeth with the appliances on and see that proper care is taken. If proper care is not taken it is her duty to persist in the effort with the child until a reasonable result is obtained.

While the case is in progress and comes in for adjustment it is examined and if necessary to remove the appliance the case may be turned over to the hygienist for the removal and to give the proper prophylactic treatment. During this treatment she should note carefully the condition of the cemented bands, the evidence of beginning cavities, an irritated gum, and if there is anything suspicious to immediately call the attention of the operator to it.

It is not intended that the operator should rely entirely on the hygienist for this, but should in fact look for these conditions at each visit, but the prophylactic work of the hygienist should include all this. Thus she may note something that might be overlooked by the operator as it is of course more easy to observe these things when giving attention to each individual tooth.

While the hygienist is at work on the first case, the operator takes up the second one and gets that under way. By this time the hygienist is through with the first case and the operator returns and replaces the appliance with such adjustments as are necessary. And so on with the other cases.

I do not mean to say that every child receives a prophylactic treatment at every visit. The frequency of the treatment depends on a number of factors such as the amount and nature of the appliance, the care the patient gives to the mouth, the diet of the patient, etc. It is desirable, however, that at every visit the mouth should be looked over and if there is any evidence of neglect at any point it should be corrected and the child's attention called to it. By this constant vigilance possibly more prophylactic work in the aggregate may be done than is absolutely necessary, yet the individual treatments may require only a few minutes and the final results are most desirable. I am sure of this because I have had cases carried over a number of years with very little reparative work done during the period of treatment, while previously the dentist complained that it seemed almost impossible to keep the teeth in repair.

While the foregoing is the most important aid to the orthodontist, there is a great deal of time when patients are not available. Yet between times there are a thousand and one things to be done. Impressions are to be prepared, models to run and separate and also to carve. The hygienist can easily be taught to do them, and if she has any mechanical skill can also be utilized to a more or less extent in the making of appliances.

There are also the books and records as well as the correspondence that may be turned over to the hygienist.

It is unnecessary to refer to the influence of the hygienist in the office and the many little ways in which she can keep things up to a higher standard. Being an operator she may appreciate these things a little better than the average assistant.

I do not know that I can close this paper better than by quoting Dr. Crosby, of New London. "The reason why we could not do without a hygienist is that we are in duty bound to bring the teeth through the period of orthodontic treatment in as good condition as we received them."

DISCUSSION

The President.—The essayist has brought out so many excellent points that we ought to have the subject thoroughly and freely discussed. The subject of hygiene and the

hygienist is one of vital importance to every orthodontist. I will ask Dr. Flesher to open the discussion.

Dr. W. E. Flesher, Oklahoma City, Okla.—In my opinion the matter of prophylaxis in the treatment of many cases of orthodontia is equally as important as the correction of the malocclusion. In a large practice I hardly see how an orthodontist himself can take care of these cases as they should be. I do not have an oral hygienist in my office, but I can readily see the need of one. The oral hygienist can spend all the time necessary to remove all stains that will form from time to time, and, as Dr. Hamilton has pointed out, she can show the patients how to use the toothbrush. She is not simply educating the children how to care for their teeth, but this education will be passed on to the parents. I am quite sure there is a place for the hygienist.

I am anxious to hear what Dr. Dewey has to say on this subject as, I understand, he believes there is some danger in the use of a hygienist. So far, I have not been able to see any grave dangers.

I wish to thank Dr. Hamilton for this very fine paper.

Dr. Harry L. Hosmer, Detroit, Michigan.—I have only read Dr. Hamilton's paper once, but I want to compliment him on the very efficient way he brought out the points in favor of a dental or oral hygienist. We are not responsible for the condition of the mouths of children before they are brought to our attention or come under our treatment. We are, however, absolutely responsible after we begin treatment. I think the oral hygienist, trained as such, adds a great deal to an office, and I am looking forward to the time when they will be licensed in the State of Michigan.

So far as the dangers are concerned, the only one I can think of is that we might be tempted to give them too much to do. In these spring days, when we are busy with our golf clubs, when we turn over a good deal of work to our assistants, if they are capable oral hygienists, the temptation is for them to do more work than they should do. That is all I can say on the subject.

The President.—Dr. Hosmer has told us something, namely, we are responsible for the mouth of the child when once that child is in our hands.

Dr. O. H. McCarty, Tulsa, Okla.—I have an assistant who has been in my office for five years. After being in practice one year I saw the need of a hygienist. She was a trained nurse before taking up this work in dental hygiene. This girl has been in my office for this number of years, and the prophylactic work is entirely taken care of by her. I never have to tell her when to take one of these children and clean his teeth. That is her place in the office. While I am away from home this week, if there is a band broken or anything happens, it will be taken care of by her. That is what Dr. Dewey is going to fight about. But if you train a girl hygienist, who has had a fundamental training in your ways of working, she can follow you up, and I believe a man can double his capacity for orthodontic work by having an efficient hygienist as an assistant.

The President.—We have our law started in Michigan, we are licensing them, but they have not had a chance to take a course since the bill went through. Our state law will catch them if we let them do anything outside of our field.

Dr. Martin Dewey, Chicago, Illinois.—If you have followed the dental literature and my writings in the last few years since the dental hygienist has been forced upon the dental profession, you would probably know I have been greatly opposed to it from beginning to end. I have been accused of not believing in oral prophylaxis, which is not true. I am opposed to oral prophylaxis being handled by any one who has less knowledge than a dentist. Oral hygiene is too important a subject, it is too responsible a subject, to be turned over to a girl who has had only nine months training in some infirmary or clinic which covers most of the studies in the dental curriculum.

Dr. Hamilton states that these girls get a thorough course. Gentlemen, if you can give a thorough course in nine months, you may as well close up the dental schools. When my friend Hamilton says that the dental hygienist is better able to do this work than the average dentist at the end of a nine months' course, it is a very unsafe statement to make.

The oral hygienist has burst upon the dental profession as a sort of propaganda. You may remember that a few years ago oral hygiene was advocated as being the saviour of the world. The statement was made that a clean tooth never decays, which statement cannot be refuted, because no one ever saw a clean tooth. Following that the Forsyth Infirmary was established; then came the Eastman Infirmary at Rochester, New York, and also the activities that were carried on at Bridgeport, Connecticut. These men advocated oral hygienists, they made big talks, saying that they were going to be necessary in our public schools; that there would not be enough dentists to take care of the public or to clean the teeth. So the solution advocated was to give girls nine months training in order to prepare them as oral hygienists, whereas it takes the dentist four years to complete his course. What are they doing? They are creating a demand for dental service to a certain extent and limiting the number of dentists. They are educating these people to have their mouths cleaned and to have dental service. The danger of the dental hygienist is now cropping up. In spite of the work being limited to the cleaning and polishing of teeth, Dr. Hamilton in his paper states that she takes off appliances. The minute she takes off a regulating appliance she is stepping out of her sphere and becomes a violator of the law.

The next thing you will have a lot of advertising dental hygienists, and furthermore, you will have a lot of them telling the dental profession what to do.

What is the condition in Chicago? During the influenza epidemic nurses were trained by the Department of Health, so that the directors of hospitals had difficulty. These girls, who were trained supposedly for the purpose of saving humanity and working in public schools and in clinics and in hospitals for the benefit of the public, are going out nursing private cases. They are doing things they should not be entrusted to do or by any one with that amount of education, because it is a well known fact, even if a dental student takes a four years' course, a lot of them cannot clean teeth. If you cannot teach a dentist to clean teeth in four years under college instruction, you certainly cannot teach a girl to do so in nine months.

Dr. Hamilton spoke of these hygienists taking impressions and making models. I still contend that if they can do all of that, the dental schools may as well close up. You all know the difficulty of taking impressions and of making models. Will you admit that a girl of nine months' training can do better than you can? If so, you may as well quit. I don't believe she can.

Another thing: we have had the dental hygienist forced upon us. It is illogical. It is not right. We educate the public for dental service, but educating the oral hygienist is not going to improve dental service.

The greatest prophylaxis measure the dental hygienist cannot legally perform, and that is the insertion of a prophylactic filling. In a conversation with Dr. Hyatt, of New York City, who is one of the enthusiastic advocates of the oral hygienist, he made the statement that as a result of investigation in one of the New York schools, 63 per cent of cavities were found in the occlusal surfaces of teeth, and simply polishing the occlusal surfaces would not prevent decay. That was decay from anatomical fissures, etc. The oral hygienist could not get down to and remove the decay from the occlusal surfaces of teeth. The only remedy is a prophylactic device which the oral hygienist cannot insert, and here is a great function that she cannot perform.

My friend Dr. McCarty says that his oral hygienist takes off appliances and does a lot of other things. Pretty soon she will be doing a lot of things outside of his supervision, which is another foolish thing under the law, because in most states we have a law which says that she must work under the supervision of the dentist. She takes a course, is granted a license, and then she is told she cannot do this or that, unless it is done under the supervision of a dentist. In other words, they make this girl something, and then take it away from her. They give her a license to do something, and then say she cannot do it. That keeps her from going out and working for herself, but as the number of hygienists increase they will go before the state legislature and make you look ridiculous, because any man with legal knowledge knows that if she has a license she has got a right to do something without being under the supervision of the dentist. These hygienists will change the law so that they can establish offices for themselves like we have

manicuring parlors, and the people will patronize them and say that oral hygiene is a good thing. As a solution of the problem you will see oral prophylaxis in the hands of hygienists who are not doing the people any good. It is really a fortunate thing that most hygienists from these schools will humbug a certain class of people who can afford to be humbugged. They are rendering inferior service. They will have all the hospitals and clinics working on people who cannot protect themselves.

I am not willing to admit that oral prophylaxis or the cleaning of the teeth by the oral hygienist will do the profession any good. They do not know enough about pathology or the underlying structures to give competent advice. If they did, we might as well close every dental school and educate nothing but hygienists.

Why do we have these people? Why did they come? In the first place, the name is unfortunate, "dental hygienist," because the term hygienist in the medical profession covers ground for a greater knowledge than these people possess. A hygienist in the medical profession is a man with an M.D. degree, who has taken extra training in sanitation. These girls have had no such training. Some fellows gave it a name because it sounded well. They are not even dental nurses.

In Massachusetts, when the bill came up creating dental nurse and hygienist, representatives of the nurses association appeared before the legislature and fought the bill, saying these girls were not nurses. The same thing happened in California less than a year ago. Some men decided in California they wanted a law licensing the dental nurse. The medical nurse did not want the term dental nurse. They fought that bill and changed the name. The bill was killed anyway. It will probably be revived. The dental hygienist is not a nurse or a dentist. What is she? She is the result of conditions that arose in these dental clinics. Where did they start it? At the Forsyth and Eastman Institutes, and in the University of California, because by doing that these superintendents of infirmaries got a number of girls to study something. They said, "You become a dental hygienist; it is a wonderful field. We will license you." The girls fell for that. The license says, you cannot do it except under the supervision of a dentist.

Now, I believe in oral hygiene and prophylaxis, but it is too important for a half-instructed individual to undertake, whether male or female, and you cannot give proper training in nine months. It is a nice ornament to have a good looking assistant in the office. If you are going to have that, have a dental assistant. A medical nurse has three years' training, which is thorough. She will not stand for a girl who has nine months' training, because it is unfair to the profession itself. You require men to study dentistry for four years, and yet here you expect an individual, after taking a nine months' course, to know more than the dentist does.

Let me cite one instance. In one city where they have a dental hygienist they pay her \$80 a month, while the dentist in the public school draws \$100 a month. He goes to a dental college for three or four years, and the girl, who takes a nine months' course, gets nearly the same salary as the dentist does. It is unfair, unsound, and one of the most illogical things ever brought out; still the profession is getting behind the movement and helping it along. I am very sorry to see the profession doing that. I am very glad to have the opportunity of speaking against this, and I shall have an editorial in the next issue of the *International Journal of Orthodontia and Oral Surgery* about it. A mistake does not make things right. What is the thing to do? One man said in an editorial in the *Dental Cosmos* last month, if you are not going to have a dental hygienist, what are you going to do? The dental hygienist will not supply the demand of the public. We have not enough dentists today. The thing to do is to make the dental profession attractive enough and make the public service count, so that more men will enter the dental profession and supply the needs. Instead of that, they are paying girls \$80 a month, and the dentist who has studied three or four years \$100. You are doing one thing and something else at the end, either raising dental education and the preliminary requirements of the dentist, or letting a species that do not belong anywhere practice oral hygiene. She is not a nurse, because a nurse will not associate with her. She is not a dentist, because she cannot practice without the supervision of a dentist. She is not a hygienist, because she has not taken as much training as a dentist, and she is simply a condition, a something

that has been forced on the profession by a few fellows who have mercenary ideas, something by which they want to increase their incomes, something that will bring them a greater number of patients so that they can play more golf. (Laughter.) If you cannot take care of patients and give them the treatment to which they are entitled, you are certainly doing a shoddy thing to turn them over to a hygienist who knows little or nothing about dentistry, who has had a little training in polishing the surfaces of teeth, who is no more efficient than a manicurist who polishes finger nails and could polish teeth.

That is the situation as I see it today. What are you going to do about it? Are you going to ride on the popular side and yield everything to the dental hygienist, or are you going to meet the situation fairly and squarely? If you can convince me that you can take a girl and in nine months' training teach her to do something that it takes a dentist four years of training to do, you may as well close all the dental colleges, and have nothing but hygienists. I thank you. (Applause.)

The President.—I think Dr. Dewey is wrong. He spoke about the short time it takes to educate these girls. I do not care particularly what you call her, hygienist, dental nurse, or dental manicurist. That is a good enough name for them as long as they do their work. A general nurse is given the responsibility of the whole human body, yet she only takes a three years' course. Now, why can't a girl learn in nine months how to manicure and clean teeth. A girl can manicure finger nails and cause infection the same as a girl might do in cleaning teeth. Any dentist is doing that which is criminal by playing golf, knowing that he disobeys the law by allowing a girl to take off appliances or to put in fillings. Because I want to play golf or something else, it does not detract from the value of the services of some one who can clean the teeth. The only drawback I can see against the dental manicurist is that the advertiser will get her, and he will use her for commercial gain. I do not like to hear Dr. Dewey say that it is for commercial gain, because in our state we are working for it, and I am going to tell you that no nobler bunch of men in any state can be found that want it any more than our men, and it is not for commercial gain but for the public good.

Now, it is not that the dentist will not clean the teeth, or cannot clean the teeth, he will not take the time. It is not because he does not know how, but it is because he can put in an inlay or a removable bridge while he is cleaning the teeth with a greater financial gain.

Dr. F. C. Rodgers, St. Louis, Missouri.—If this society places itself on record that the orthodontist is responsible for the condition of the mouth and health of the child, I think we are assuming a tremendous responsibility in the eyes of the public and in the eyes of the law. I do not think we realize the responsibility we are assuming. We may come to the point where a case may be brought into court and the position of this society tested in regard to the responsibility of the orthodontist to the health of the child and the condition of his mouth. We are liable to some extent in the eyes of the law. But I do not think we should assume such tremendous responsibility.

With regard to the dental hygienist, Dr. Dewey stated she is allowed to remove appliances and to take impressions. These dental hygienists can also take advantage of the privilege for edentulous mouths of sending impressions to the laboratory and having dentures made; also to place appliances in the mouth on their own responsibility, and the law will sustain such an operation if you license them as a practitioner. There are certain limitations and certain advantages which should be considered.

Dr. Max E. Ernst, St. Paul, Minn.—Our President has said that the law in Michigan is such that they can get after advertisers. Let us be thankful that they have a good law in Michigan by which they can get after advertisers and let them enforce it.

I want to say that the University of Minnesota has put in a course for dental hygienists. That course is two years. It will compare with any three-year-course for medical nurses given in a hospital. We have a provision in our law that before June 1st of last year, assistants, who had been with dentists for three years, were permitted to take an examination. How severe the examination was I do not know. The question is not whether these girls can do this work better than the average dentist can. In most cases they will do it better than the dentist does. There was an interesting article in the *Dental*

Cosmos for last November in which the author brought out some fine points regarding the dental hygienist. Whether it is the best thing for us to have dental hygienist or not, we cannot say at this time because the subject is one that is in its infancy.

Dr. Harvey A. Stryker, Rochester, New York.—After listening to this most interesting discussion I feel prompted to say just a few words. It has been my opportunity and pleasure to observe some of the work which the dental hygienists are doing in Rochester and my remarks will be based entirely on these observations.

I agree, in some respects, with what has been said relative to the limited course of instruction which the dental hygienist receives, but am inclined to take issue with those who question to a marked degree the ability of these young women to do good prophylactic work. *"I will wager that the average dental hygienist, upon the completion of her intensive course of instruction of nine months, is better fitted to do good prophylactic work than the average young man who has just been graduated from a dental college."*

In a busy Orthodontic practice one's time and attention is so concentrated on the many problems confronted each day that one does not take the necessary time to do thorough prophylactic work. Too often the patient is carelessly referred back to the dentist with the result that prophylaxis is either entirely overlooked or given but slight attention. This may be due partly to the fact that some or all of the appliances have been left in the mouth. It is my conviction, gentlemen, that we have no reason to expect that a thorough prophylactic treatment shall be performed until we have first removed even the simplest form of appliance temporarily from the teeth. Where patients must be referred, this is obviously inconvenient.

General practitioners are, in many instances, accusing us of being responsible for caries of the teeth during the period of treatment, but since extensive caries is observed in children who have never had appliances on their teeth, the accusations are often unjust. However, we face a grave and important question and it behooves us, for the good of our specialty, to face the issue squarely.

Many dentists prefer that the orthodontist assume full responsibility, as regards prophylaxis, during Orthodontic treatment. It is certainly more convenient to the orthodontist and the treatments would be more frequent and more thoroughly performed. It is not expected that the prophylactic treatments are included in the estimated fee for orthodontic treatment but are charged for as given. The patient's personal care of the mouth would determine, of course, the number of treatments required.

I will conclude by saying that I believe that our time and attention is concentrated on too many other problems, which are more important, to be annoyed with the prophylactic work. The lesser of two evils would be to have a dental hygienist in the office caring for the youngsters as often as seems necessary and instructing them in the proper care of their teeth and other detailed instruction. In this way we are going to come nearer the solution of this most vital question.

Dr. W. W. Martin, Iowa City, Iowa.—I am giving all my time from 8 o'clock in the morning until sometimes 6 in the afternoon to the State University of Iowa. We want to do down there the best we know how. I am going to say this: If you fellows will get behind your own state universities, your own colleges, and push this thing as hard as you can to help the dentists and dental students to get this training, the same as you are pushing the dental hygienist, you will have no need whatever for the dental hygienist in your office.

If I should go into private practice again, I would probably not have a girl so far as an assistant is concerned, but I would have one to look after the business part of my practice. Whenever we give up the work of prophylaxis and entrust it to others, the trouble in connection with our work begins. I am very much interested in seeing you men get behind this proposition and push it in so far as the schools are concerned. We do not have enough teachers and enough instructors, and if you will work as hard to get your state legislature to insist on these things in institutions, then your dental hygienist will have no field in the dental office.

I have been in several offices around the State of Iowa, and young men are doing good work along prophylactic lines because they are interested in it. I can speak of one

man especially who for every case he has uses a glass test tube long enough to take in a toothbrush, and that brush is sterilized and is used by himself in cleaning the teeth of the same patient each time he returns. If we are going to do the work, of course, that is a different proposition. You will have to have some one to do some part of the work. If you want to render the best kind of service you would do it all yourself and have your assistant take the business end of the proposition. I find most of our men, operative and prosthetic, are doing their own work. That is the main thing. I am thoroughly in favor of oral hygiene. I have made up my mind that I will watch my cases as they go through and see if they come in properly treated, and I began my treatment to see how much decay was caused by the orthodontic appliance, and I can safely say from now we do not cause more than 2 per cent decay in these mouths from the time we start until we get through with them.

Dr. Hamilton (closing the discussion).—I am very much gratified at the amount of discussion that my paper has elicited. I did not wish to treat this matter of the hygienist from the standpoint of the general practitioner. That was hardly within the province of the paper. I have had a hygienist in my office for nearly three years, and I feel very well satisfied and would not care to give her up.

I will not attempt to answer all of the points that have been brought out because many of them have already been answered by the different speakers who have taken part in the discussion. I made the statement that the hygienist received a thorough course. That depends perhaps on what we mean by a thorough course. From Dr. Dewey's standpoint perhaps it is not a thorough course, but as one of the speakers pointed out, the hygienist is trained for one particular thing, to clean teeth, and nine months of intensive work of that one thing certainly ought to be considered fairly thorough. I did not want to create the impression that the hygienist could clean teeth better than the dentist. I said she will do this work more thoroughly and efficiently than the average dentist, and I think most of the men here will admit that. I did not say anything about her taking impressions; I said she could put together and prepare the impressions and run models, separate and carve them.

Dr. Dewey spoke of prophylactic fillings, saying that the hygienist could not put them in. I do not know what your experience has been, but I find the average filling is not a perfect prophylactic one. Frequently I find it necessary to reshape with a bur occlusal fillings in the molars to permit proper cusp relation. I think some of the objections that have been raised have been carried to an unwarranted extent. I do not think I have gone beyond the scope which the law lays down, simply the cleaning of the teeth.

There is one thing that has been brought out here, and that is that prophylaxis during orthodontic treatment is necessary. I do not think any one who has practiced very long will fail to admit that. If it is necessary, and we can turn it over to a hygienist, we conserve our time, and keep these youngsters from waiting, we have both gained.

A PLAN OF TREATING NEUTROCLUSION WITH LABIO- VERSION OF MAXILLARY INCISORS*

By OSCAR E. BUSBY, D.D.S., DALLAS, TEXAS

Professor of Orthodontia and Comparative Dental Anatomy, Baylor University Dental School

IN presenting this treatment for Class I, Type 2, cases of malocclusion, I do so because of the difficulties I have experienced in my own practice with these cases, and through the observance of a few of this type, which have been referred to me for continued treatment, by other orthodontists, by reason of the patient's change of residence.

The accompanying illustrations will show the result of treatment through the use of intermaxillary anchorage, and also the result of treatment by the employment of intramaxillary anchorage.

CASE 1 (Figs. 1 and 2).—The case, which is here shown, was treated with the clamp bands upon both the upper and lower first molars and labial alignment

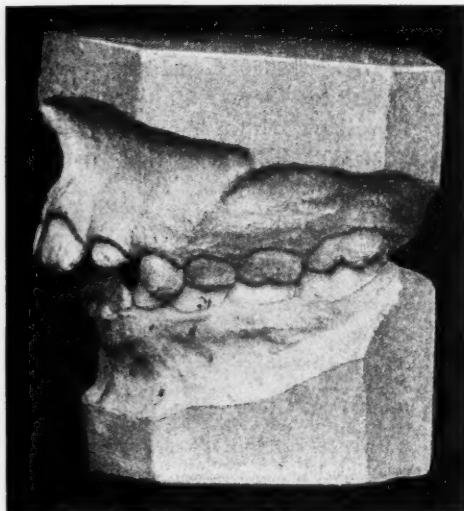


Fig. 1.

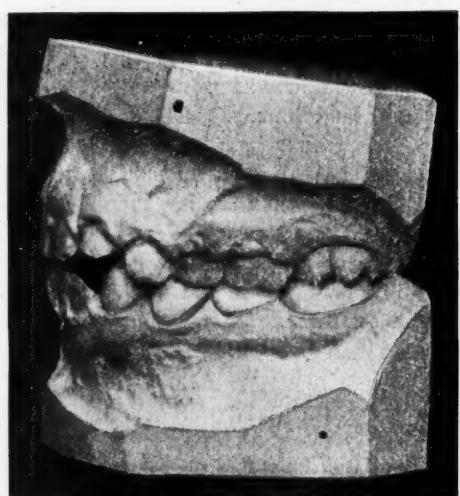


Fig. 2.

wires. You will note the open-bite condition in the region of the incisors in the finished case. This case was taken from one of our best text books on orthodontic treatment, and the open-bite condition may be the result of one, or a combination of three things: The interelastic pull between the upper and lower arches has caused a superocclusion of the anchored teeth, or a shortening of the anterior teeth, or is possibly due to a photographic error.

*Read before the Alumni Society of the Dewey School of Orthodontia, Chicago, April 1-2-3, 1920.

CASE 2 (Figs. 3 and 4).—This case is one, which had been treated for more than a year, through the employment of the same form of anchorage as was used



Fig. 3.

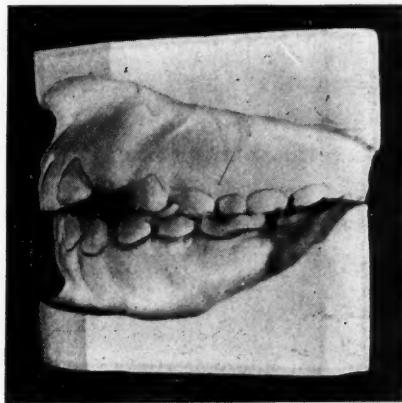


Fig. 4.



Fig. 5.

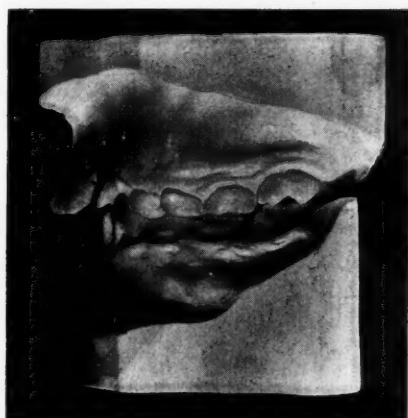


Fig. 6.

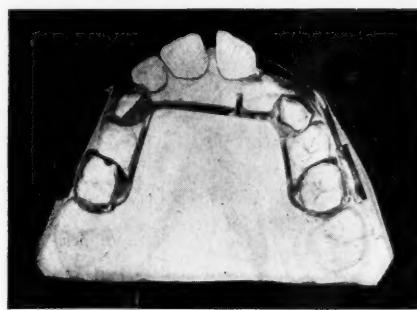


Fig. 7.

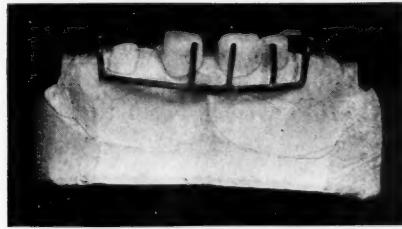


Fig. 8.

in the first case. You will note in this case also the open-bite condition in the region of the incisors.

CASE 3 (Figs. 5 and 6).—In this case, the Lourie appliance, which Dr. Dewey has so thoroughly and carefully described both in the journals and in his

instructions to students, was used, and was treated in the following manner: Through the use of a form of intramaxillary anchorage, which the appliances upon the teeth will illustrate, plain bands, with a soldered lingual alignment arch, were placed upon the lower teeth to give lateral development if necessary.

Plain bands (Fig. 7) with a soldered lingual arch, were placed upon the upper deciduous second molars and canines to give stability to the anchorage, and through buccal tubes on the molar bands, the labial arch, as is shown, was ligated to a small hook near the canine, and back of the tube on the molar bands. The traction produced by the grass ligature reduced the labial version of the upper

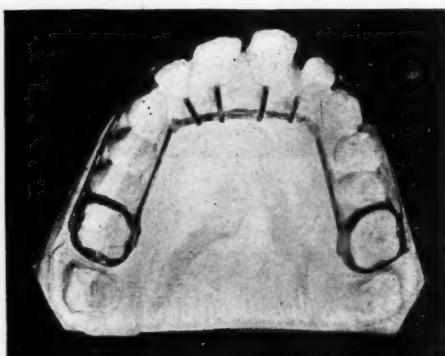


Fig. 9.

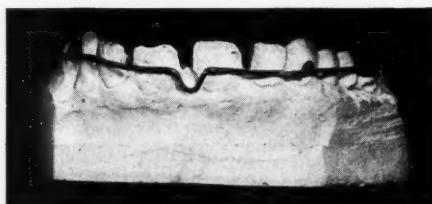


Fig. 10.

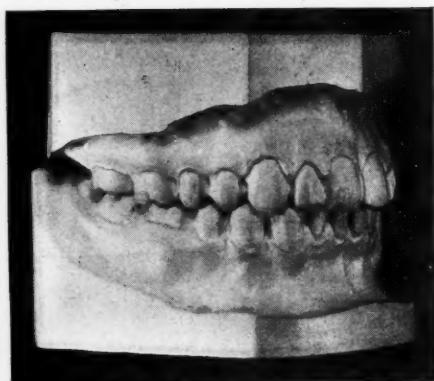


Fig. 11.

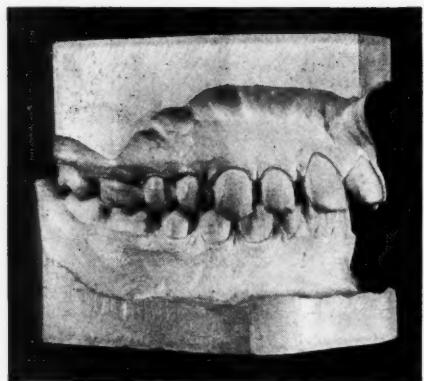


Fig. 12.

incisors (Fig. 8). Note that the open-bite condition does not here exist to an appreciable degree.

CASE 4.—In this case of an older patient practically the same form of intramaxillary anchorage was used as the last case illustrated. Instead no bands were placed upon the upper canines. Plain bands were made for the first upper molars, with a soldered lingual arch, with short extensions resting just beneath the gingival marginal ridges of the incisors, and upon the labial surfaces of the teeth was also soldered a labial (Fig. 9) arch with a loop (Fig. 10) about the median line. By slowly closing the loop, the upper incisors were caused to assume their normal positions.

In conclusion (Figs. 11 and 12) I would like to state that in the treatment of these cases, we usually find the lower arch about normally developed. Therefore, in a few instances, I have placed no appliance at all on the lower arch.

DISCUSSION

The President.—Dr. Busby has described a condition that to me is the hardest case of malocclusion to correct. He has brought it out in a very fine way, and I think his paper is worthy of a lot of discussion. The two men that are on the program to open the discussion are absent at this time.

Dr. C. M. McCauley, Dallas, Texas.—As the president has said, this is a difficult class of cases to handle, and I have handled them in a different way from what the essayist has, but I believe his method is better than the method I have been using.

The plan I have followed in the treatment of such cases consists of first molar anchorage with lingual bar as stabilizer. Buccal tubes to carry 20 to 22 gauge labial arch, which is so adjusted as to lie on the occlusal side of spurs soldered to bicuspid bands and on the gingival side of spurs on anterior teeth it is desired to lengthen. This labial bar is so bent and shaped as to exert force in the manner of a lever of the first class, where the molars represent power; bicuspid spurs, the fulcrum; and the anterior teeth, the weight.

By the essayist's plan many bands are dispensed with and that speaks volumes in the favor of his appliance, on account of their irritating effect on soft tissues. All orthodontists are trying to eliminate them wherever possible.

When Dr. Lourie first advocated the use of the high arch with soldered finger attachment I used it successfully in many cases with the exception of displacing anchor teeth badly. The lingual stabilizing bar which I now employ will remove that difficulty to a great extent.

The essayist's plan of treating these cases will be of service to me because I have now a case under treatment in which I expect to use it.

I am very much obliged to the doctor for presenting this appliance. It was my pleasure to see the same presented by him to our own state society about a month ago, and I want to congratulate this society upon having had it presented here.

Dr. W. E. Flesher, Oklahoma City, Okla., was called upon to continue the discussion. He said: Dr. Busby has given us an excellent paper and I appreciate it very much and thank him for preparing it and presenting it before this alumni. He has covered the subject very thoroughly. I do not believe I can add anything to what he has given. I use practically this same plan of treatment in this class of cases.

The President.—The open-bite cases are important and I want to get all the information I can on this subject.

Dr. E. E. Richardson, San Francisco, Cal.—In treating open-bite cases I use plain labial expansion wires, banding the first permanent molars, soldering partial lingual wires to the bands, extending to the first bicuspids, and buccal tubes, for the expansion arch, wiring through the interproximal space engaging the lingual wire and the expansion arch (having removed the nuts). By expanding the arch relieves the close contact of the teeth and the pressure of the arch against the anterior teeth under the stress of mastication corrects the open-bite.

Dr. H. C. Hopkins, Washington, D. C.—I do not know that I can add anything of importance to the discussion of the use of these appliances in the treatment of this particular form of cases, but I am very glad to have had the opportunity of hearing these appliances brought to the attention of the society again, because I think the appliance is one of extreme usefulness, and one with which I personally have had a wonderful amount of success.

The caution given as to the danger of misplacing the molar teeth and the necessity for reenforcing anchorage with a soldered lingual arch I think is very essential, because

there is no question but that the action of the high labial arch wire is such as to readily disturb the molar anchorage if that is not efficiently reenforced.

Dr. Busby has shown you a very simple and useful method of correcting this particular character of case, and I have found the same appliance, the high labial arch wire, with the extended finger springs, very useful in the variety of cases which will successfully rotate the anterior teeth except the cuspids, and reduce the angle of inclination better than anything I have ever used; I think it ought to come into more general use, and I am very glad to see it mentioned again before the society because I think with the caution of being exceedingly careful to reenforce the molar anchorage, we will find it will be an exceedingly useful appliance.

Dr. Busby (closing the discussion.)—There is very little I can add to what I have already said, as I have told you all I know about it, and I thank you very much for this opportunity to close the discussion.

THE MEANING OF THE NORMAL

By A. LE ROY JOHNSON, D.M.D., BOSTON, MASS.

Professor of Orthodontia, Tufts Dental School

IN medical and dental literature of the present day there is evident a confusion of ideas as to the meaning of the word normal. In fact the variety of ways in which the word has been employed has resulted in so obscuring its real sense that the idea now conveyed by it, especially in the biologic sciences, is not at all clear. One writer uses it as meaning an ideal, a goal to be sought after but never to be found; another interprets it as being synonymous with typical or average; while yet another refers to normal as signifying the natural. Such free and indefinite use of a word is of course wholly unscientific and cannot fail to take away much of its significance. Moreover, the custom of giving the word normal such an indefinite, free, unscientific interpretation reflects a very superficial attitude toward medical and dental problems in general. You will remember that words symbolize ideas. A clear mind will express itself clearly. The form may not be pleasing but the idea will be distinct.

The nature of the structures with which the dentist is concerned, *i. e.*, the teeth and their supporting and surrounding tissues, forces him to a careful analysis of the meaning of the normal. It is even more necessary that he should have a clear conception of the significance of the word than it is in some of the other branches of medicine. This suggests a distinction, a knowledge of which is fundamental in dental science.

Although we know that literally an organism is constituted of parts mutually dependent and essential, it is a matter of common knowledge that in the human organism some parts are more essential to the life of the organism than are others. The small intestine is more essential than the appendix; the muscles of the back are more necessary to survival than are the muscles of the fingers or feet; a man can live longer without teeth than he can without a stomach.

However, to say that one organ or part is more essential to the life of an organism than is another organ or part does not necessarily mean that they are more important in a consideration of the health and development of the organism as a whole. In fact I think it is quite the reverse. The covering of hair,

the vermiform appendage, the caecum, the large intestines, and the teeth, while not so necessary to existence as the heart and small intestine, are more potent sources of disease and disorganizing deformities. Consider the frequency of cancer of the stomach; is it not safe to assume that it is associated with the limited usefulness of this organ? Men can live without teeth, yet it cannot be said that they are useless and harmful. However, the prevalence of dental disease and deformities of the dental arch argues well that the masticatory apparatus is at the present age out of harmony, to a certain extent at least, with the fundamental needs of the race. And it is because of this that the question of its care is a complex one. We should think of the teeth and the dental arch in the evolutionary sense, realizing that we are concerned with a part of the human organism unstable because relatively unessential, important in the consideration of the health and development of the whole individual because of the instability of its organization. In other words, from the fact that the forces of evolution have tended to limit its usefulness in sustaining life, a knowledge of the nature of the masticatory apparatus which is best adapted to its present function in the economy of the whole is more difficult to obtain and is as indispensable as it is difficult.

Thus in the consideration of organs and parts which constitute the more vital units in the organization of the individual the concept of the normal plays a different rôle than in the consideration of those parts which are more remote in their influence and indirect in their effect upon life processes. While a clear conception of the meaning and significance of the normal is necessary in either case, in the consideration of the latter group, the less essential parts, it is a practical necessity. The condition of one of the more essential parts of an organism directly shows itself in the functional activities of every-day life, but the relation of the appendages, accessories, disharmonies, if you will, is often so obscure in the life phenomena of the whole that the condition of their development is not so obvious. Hence the study of such structures is more complex and necessitates a more careful, comprehensive, and analytical consideration of conditions which determine its influence upon the organism as a whole; in a word, its normality.

In most of the textbooks on orthodontia, it has been customary to define "normal occlusion" as "the normal relation of the occlusal inclined planes of the teeth when the jaws are closed." I cannot believe that this definition is satisfactory to anyone. To say of normal occlusion that "it is the normal relation of the occlusal inclined planes of the teeth" does not help us in the least to know what normal occlusion is. We know occlusion to be the transient approximation of tooth surfaces; but what of normal occlusion? One might as well say in describing a brick fireplace that it is a fireplace made of bricks as to say that "normal occlusion is the normal relation of the occlusal inclined planes of the teeth when the jaws are closed" and not at the same time tell what normal is. Knowing what occlusion is, we want to know what particular form of occlusion is designated by the word normal. We know what the dental arch is, but what is a normal dental arch?

The word normal is defined clearly enough in the dictionaries. Webster says that normal is "according to or not deviating from an established norm;"

and then defines norm as "a rule or authoritative standard." As used in the organic sciences, normal is "according to, constituting or not deviating from a standard or rule which is observed or claimed to prevail in nature." Normal is not synonymous with natural, the two words do not convey the same idea, they cannot be used interchangeably.

When we enter the realm of biology it seems upon superficial reading that the word normal is used in contradictory ways. Nevertheless, I believe that in many instances the confusion is due to the difference in the nature of the conditions referred to rather than to a different interpretation of the word. The standard to which normal refers depends upon whether the problem is one of species or whether it is a question relative to the individual organism. Please note how Thomas Dwight uses the word normal in a chapter on Variations and Anomalies, as illustrating the former. He says, "There is *normally* in the human shoulder blade a little projection from the lower part of the front border." In another place he says, "There are also anomalies of tissue, in which a certain structure that is usually of one material is made of another, as when what is *normally* a cord is made of a bone or cartilage." I quote again, "Now I found this form of muscle in both arms of the chimpanzee, and Macalister observed it *once* in the tiger, though it is *normal* to neither." Here as generally in the field of morphology, normal refers to the most usual, *i. e.*, a condition characteristic of a race, group, or species. There are exceptions, but the rule is that the condition prevails. Normal refers to the fact that the conditions, though admitting exceptions, can be taken as a standard. Take, for example, the number of ribs of the individual human organism. The large majority of men possess 12 pairs. This, then, is the *normal* number for man. Yet individuals are known to have eleven or thirteen pairs of ribs. One with thirteen pairs has an *abnormal* number as regards the standard for the species, although individually he may be a perfectly *normal* organism. Hence in morphology normal signifies a standard determined by the constancy, the prevalence, the frequency of the occurrence of a condition in different organisms of a species. For this reason and for the sake of clearness it may be permissible to designate as the species normal this interpretation of the word, since we mean that the individual conforms to the standard for the species.

But when the object of consideration is the relation of an organ or part to the individual organism the standard to which normal refers is of a different kind. For instance, we know that the presence of a stomach is normal for the human being, meaning that the large majority of human beings are in possession of an organ called the stomach which presents many morphologic characteristics common to the same organ in the other human beings. But what do we mean by a normal stomach in the sense of its relation to other parts of the organism? A normal individual has two feet which possess characteristics common to the human foot, but what is a normal foot? A normal characteristic of the human being is weight, but what do we mean by the normal weight of a particular individual? So as in the species sense the word normal refers to a standard of numerical frequency, in the individual sense it refers to a standard of a functional nature, a physiologic correlation.

A normal stomach, then, in one sense of the word, is one which in function is best adapted to the needs of the individual organism of which it is a part. This is determined by its functional efficiency. The standard is a physiologic one. Although a consideration of the size, form and position of the stomach is sometimes necessary in ascertaining the cause of functional difficulties, one does not attempt to measure it or to visualize its form to know whether or not it is normal. The question of the normal is in this instance a physiologic one, a standard of functional efficiency in its relation to the life activities of the whole individual organism. In the same sense a foot is normal or abnormal as its functional activities help to maintain or to interfere with the organization of the whole individual. A normal foot is one that functions properly; an abnormal foot is one that does not. (Of course here the word function is used in its broadest sense.) Because a foot does not conform in size and shape to a conception one may have of an ideal human foot does not fix it as abnormal for the individual. The concept of the typical form of the foot is utilized as a basis for the consideration of morphologic characters, but the condition which determines whether a foot is normal or not is the relation it bears in function to the other parts of the organism. The question is primarily one of physiologic correlation. If you would know whether the weight of a child is normal or abnormal, not as compared with other children, but for a particular child, it is a problem of all vital processes and functional activities, local and general. Merely weighing the child is of little value and means nothing unless the weight is correlated with height, vital capacity, physiologic age, general form of structure, and metabolic processes. The significance of weight is derived from a study of the vital processes of the whole individual. Thus the normal is in this instance as in those above, one of a physiologic correlation. In the *individual* sense the standard referred to by the normal is in the ultimate determined by the life activities of the individual organism as a whole. A part is normal or abnormal to the individual as it affects the organization of that individual.

The same is true of the dental arch and occlusion. When either is considered from the standpoint of morphology alone it is normal or abnormal as it presents the characteristics common to the race, group, or species to which it belongs. From this position the dental arch of man is normal in its development in that it conforms to a standard of development determined by the observation and comparison of many specimens. Thus in one sense of the word the occlusal relations of the teeth of an individual are normal or abnormal as they are like the condition of occlusion that is characteristic of the majority. Normal is not perfection; it is a standard in actual existence.

In the consideration of the dental arch and occlusion of the teeth in their relation to the individual organism the normal, although referring to phenomena of a different nature, designates a standard as truly as it does in the group or species sense. The standard referred to here not only involves a morphologic correlation, but in the ultimate implies a standard of a functional nature. It refers to a condition which is most effective in establishing and maintaining in its most stable form the organization of the living organism.

The observation of the occlusal relations of the teeth of an individual as exemplified in the plaster models, enables one to ascertain in what degree the condition of occlusion approximates the typical. The occlusal relations of the teeth of an individual will never be the same as the typical in all particulars since type is not a fixed point, but an abstraction determined by the extent and direction of individual variations. One may refer to the occlusion of an individual as being normal in the sense that the condition of occlusion comes within the range of variation characteristic of the majority of the members of the group to which the individual belongs. It is normal in the sense that it possesses many of the characteristics expressed as typical.

But in orthodontia we are more directly concerned with occlusion in its relation to the individual organism of which it is a part than with its relation to the occlusal conditions of other individuals. Our problem is to determine in what degree the occlusal relations of the teeth and the form of the dental arch of an individual can vary from that which is characteristic of the group or species and yet be consistent with the needs of the individual organism. Hence in the ultimate the standard to which normal refers to the consideration of occlusion in its relation to the whole individual is a criterion of a functional nature rather than a fixed concept of structural forms and relations. Such an interpretation of the normal involves a study of life processes in general. The collective or species normal is our basis of study; our guide; our ideal in the consideration of the individual. Yet in view of the facts of variation and heredity the question of the individual normal involves a problem of physiologic correlation which designates the individual normal as a standard of a functional nature, determined by the action, reaction, and interaction of the parts and processes in the life activities of the whole individual.

The place of the teeth in the organization of the human being living today makes it imperative that the dentist, and especially the orthodontist, should study the meaning of normal. The conception of the normal dental arch is the foundation of modern dentistry. To assist in establishing and maintaining the normal functional activity of the masticatory apparatus of the living human being is its purpose. Thus the concept of the normal, what it means, what it signifies, is at the very foundation of dentistry, and its careful analysis is a practical necessity to the progress of the science.

DEPARTMENT OF ORAL SURGERY AND SURGICAL ORTHODONTIA

Under Editorial Supervision of

M. N. Federspiel, D.D.S., M.D., F.A.C.S., Milwaukee.—Vilray P. Blair, M.D., F.A.C.S., St. Louis, Mo.—Arthur E. Smith, M.D., D.D.S., Chicago.—William Carr, A.M., M.D., D.D.S., New York.—R. Boyd Bogle, M.D., D.D.S., Nashville.—Major Joseph D. Eby, D.D.S., Atlanta.—Thos. P. Hinman, D.D.S., Atlanta.—Arthur Zentler, D.D.S., New York.—Leroy M. S. Miner, M.D., D.M.D., Boston.

CONGENITAL CLEFT PALATE AND HARELIP*

By Wm. L. SHEARER, M.D., D.D.S., OMAHA, NEBR.

CONGENITAL cleft palate with harelip is without question one of the most, if not the most, conspicuous of deformities which may befall a child. No more distressing a calamity, it seems, can come to parents. Especially is this true from the mother's viewpoint.

While there has been much written upon the subject of cleft palate and harelip and its surgical correction, it is evident from what we see of the results of the great majority of cases, that much more must be written and greater thought given. Certainly, greater preparation upon the part of the surgeon must, in the light of our present achievements, be given, if the child is to receive at our hands that to which he is entitled.

This deformity, when not properly corrected, is a source of grief to both the child and his parents all through life. It is a deformity so deeply felt by the one afflicted that he will shun society. In consequence of this his advancement is materially hampered along with his opportunity to gain a livelihood.

Cleft palate is the result of failure of union of those parts which make up the palate, during development in embryo. The child at birth possesses the normal amount of tissue, with rare exceptions, to form a perfect palate if properly managed. The muscles of the palate, like other muscles of the body, if not in proper function, atrophy. For example, bind one arm to the side of the body and very shortly atrophy follows.

When a cleft of the palate is not closed sufficiently early, usually the palatopharyngeus muscles do not develop as they should. In this connection we can readily see that comparatively early surgical intervention becomes necessary.

The indications and contraindications as to the time to operate different forms of cleft of the palate will be considered in a later paragraph.

*Read before the Alumni Association of the International School of Orthodontia, Kansas City, Mo., July, 1920.

HISTOLOGY AND EMBRYOLOGY

In the formation of the palate there are six centers of ossification, two maxillary, two premaxillary, and two palatal. Associated with these bone centers are soft tissues, mucous membrane, periosteum, etc., which form a normal palate. Only when an interference of some character occurs, do we have a cleft palate result, associated frequently with a cleft of the lip.

During embryologic development all babies have cleft palates prior to the second month of gestation. Near the end of the eighth or ninth week of the embryo the palatal processes should be perfectly united.

CAUSES OF CLEFT PALATE, PREDISPOSING AND EXCITING

There has been much written in all languages relative to the etiology of cleft palate, yet most may be, and unquestionably is, conjectural. This deformity is like all other teratology, subject to further investigation. Different writers

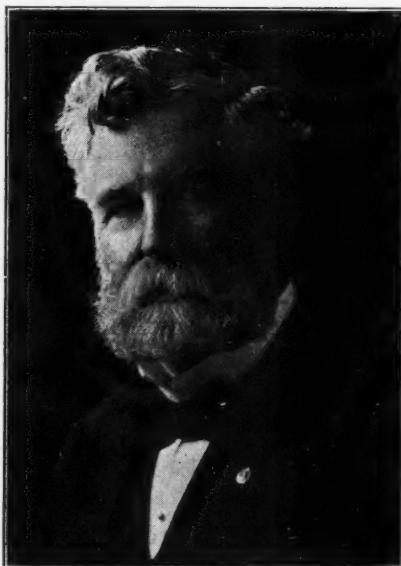


Fig. 1.—Dr. Truman W. Brophy. A true teacher.

have attributed as causes, uterine inflammation, venereal diseases, maternal impressions, pressure, defective nutrition during the early weeks of gestation, heredity and intervening mucosa in tooth enamel formation. Of the several causes, the factor standing out most convincingly to many, is heredity.

Observations made by Dr. O. A. Strauss in the study of abnormalities of animals in the zoological gardens in Berlin, October 1913, are particularly interesting. Thirty-two jaguars born of one mother by the same sire within one year had cleft palate and all died.

The parent animals were fed cold meat, from which the blood had been allowed to escape. Later the diet was changed and they were fed meat which was still warm and which contained blood, and upon this diet not a single cleft palate occurred out of two litters in one year, (about twenty-one jaguars). (Brophy's Surgery. Pages 579-80.)

On the other hand, Mall's investigation on the collection of monsters at Johns Hopkins is at least suggestive that the primary factor is located in the embryo.

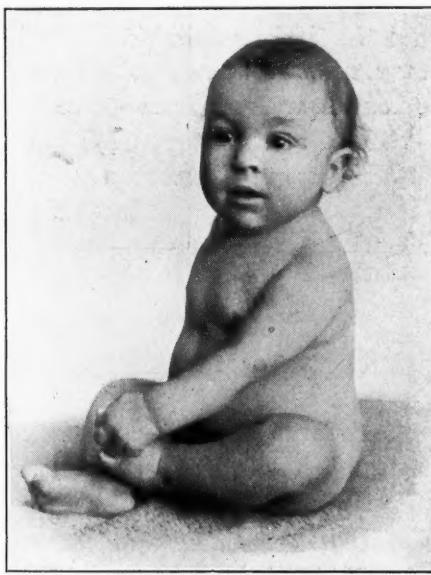
It has been my experience when possible to obtain a good history of a family, that almost always a record of cleft palate is noted. In a case which I reported



A.



B.



C.

Fig. 2.—Case 1. A. Note the divergence of the nose to the left in single clefts of this character. B. Note the nose in median line of the face after Brophy operation upon the bones has been made. The Brophy operation where the bones are involved can be considered in no better sense than the "foundation upon which the house is built." C. Completed case. Age, sixteen months.

a few years ago, where all knowledge of cleft palate history was denied, close study revealed a small niche in the mother's upper lip, left side. Then, too,

parents are reluctant to give their true history, so it is often difficult to trace heredity.

As a general thing, nature does not fail to provide sufficient tissue to form a normal child with a normal palate, but often fails to bring the parts in apposition so union will result. We are consequently dealing with a true arrest of development.

No doubt falling metabolism may play an important role in a certain few instances. However, it is my belief that the child may be generally a weakling and yet be normal as to formation of parts.

It has been stated by Professor Warnekros that supernumerary teeth are always the cause.

The late Doctor C. F. W. Boedecker attributes the cause to intervening mucosa during the formation of the teeth, as at that time the mucosa dips deep down



A.



B.

Fig. 3.—Case 2. *A.* Double cleft palate with premaxillary protrusion. This premaxillary bone should never be excised. It contains the temporary as well as the permanent tooth follicles. A calamity follows the excision of the premaxillary bone which it is impossible to correct. *B.* Profile after Brophy operation is employed for the setting back of the premaxillary bones into position to form a normal arch.

into the submucous tissue and forms the epithelial lamina, which later contracts into the epithelial cord at the distal end of which the enamel organ is formed thus forming an obstruction in union of the tissues.

Brophy says, "It seems that Boedecker's conclusion that this epithelial cord delays union of the parts forming the maxillæ, and the force exerted by the tongue and mandible from the beginning of the third month until birth and several months later, would account for the separation of the maxillary bones and the creation of the cleft."

Uterine inflammation and venereal disease: no doubt venereal diseases are the cause of many physical defects, also uterine inflammation may effect the development of the palate, as it does many other parts of the body.

Dr. Charles Mayo believes and has said, "There is a great principle involved in the causation of birth deformities, and it is one which should explain various types of deformities. As he observes birth defects or anomalies, it is apparent that many of them are normal conditions in some lower type of life, e.g., harelip,



C.



D.



E.

Fig. 3.—Case 2. C. Front view after bone operation only. D. Immediately after correction of lip deformity. E. One year later.

cleft palate, fissure defects, etc. Anomalies in circulation, multiple ureters, location of organs and defects due to changes in the evolution of the invertebrate to the vertebrate which largely affect the nervous system, acephalus, hydrocephalus, spina bifida, club foot, and postanal dermoids.

"Experimentally, changes in the salts in which the eggs of several of the lower forms of life are developed, lead to a certain percentage of anomalies. This is undoubtedly the reason why a high type of fish, like the salmon, probably in an evolutionary state, leaves salt water to lay eggs in fresh water.

"Anomalies in the human embryo occur in variation of fluid, especially excessive quantity of hydramnion. It is most probable that the cause of embryonic deformities is due to changes in the salts of the amniotic fluid in which the egg is developed, just as it has been proved to be in the lower types of life."

We are therefore inclined to conclude that whether from inflammation of the female pelvic adnexa or from a more subtle cause, the early nutrition of the embryo is interfered with, thus producing a disharmony of the growth energies.

Exciting cause: The tongue is thicker between the second and third months of intrauterine life than it is at birth, and consequently takes up more space between the developing bony plates of the palate, thus interfering with their meeting and union. The muscles of mastication becoming active about the third month brings pressure from the mandible on the flexible bones of the palate, serving as a wedge, forcing the halves apart, resulting in a much wider breach.

Normally, the upper jaw, from tuberosity to tuberosity, is smaller than the lower jaw. If careful observations are made of a child with a complete cleft of the hard and soft palate, it will be found that the upper jaw overlaps that of the lower. This makes it easy to see how the mandible may and does spread the two halves of the upper arch.

The normal position of the fetus in utero is such that a great part of the body weight may be thrown upon the vertex, and the pressure exerted tends to force the mandible into contact with the sternal region, and compress it against the forming hard palate. The head being in a flexed position with the symphysis of the mandible resting on the sternum, may add to the force exerted by the mandible.

PHYSIOLOGY

It is most difficult for a child with cleft palate to swallow, and to draw its milk, and as a result they are very poorly nourished. The milk taken, in the act of swallowing, regurgitates through the nose, a most distressing and pathetic sight. Dr. Brophy has designed a nipple that enables the child to take its food with little difficulty, and it is surprising how quickly they recognize this and poke their noses around in search for the nipple before beginning to nurse from their mother. He has also designed another nipple for the bottle babe made on the same principle. I have been convinced many times that the value of feeding the infant preparatory to surgical intervention was sadly overlooked. Failure to secure proper nourishment is a valid reason for early operation.

The anatomy of the palate will not be considered in this paper, other than to state that there are, as classified by Brophy, fifteen forms of cleft palate and that the form decidedly governs the time of operation, etc.

TREATMENT

It must be borne in mind that the palate is one of the most important organs of speech, and it being directly attached to the larynx, makes it a most valuable

factor in voice production. The articulation of consonant sounds is very difficult for cleft palate children. I recall one young lady twenty-seven years old, living in California, for whom I had operated an extensive cleft palate, who had much difficulty in learning to talk. I kept in correspondence with her for two years directing her in learning to speak over again.

Great patience should be manifested for those so afflicted, as they have more trouble than we are able to appreciate and are almost always too timid to seek



A.



B.



C.

Fig. 4.—Case 3. *A*. Illustrates rather extensive cleft of the hard and soft palate for a woman forty-four years of age. *B*. Palate completely closed with one operation. No lateral incisions were employed. *C*. Photograph of patient.

our cooperation. A neurologic perversion may have become established in the brain center, which is most difficult to correct. We must remember that the closure of the palate is not the only thing sought for, the most important, by far, is presenting to the patient a flexible, resilient palate, which is so much needed in speech, etc.

A babe with complete cleft palate and either single or double harelip should be treated in three steps, as follows: 1. Closure of cleft involving the anterior ridge of the hard palate if possible within the first month to six weeks of age. 2. Lip and nostril, six weeks after the bone operation, or earlier, if the bone operation has been successful and the splints removed. 3. The soft palate about the fourteenth to sixteenth month, preferably.

The general condition of a babe should be considered carefully. Too often these children are brought to the hospital and operated at once. Then in a couple of days a cold develops which may have been picked up on its way there, which, added to the anesthetic and operation, may result in pneumonia and death.

The bone surgery should be done early before ossification has advanced, the bones being more easily moved to the position desired and the shock is much less to the patient. At birth the bones are about half organic matter and easily bent.

When there is a double cleft with premaxillary protrusion, this premaxillary bone must never be excised. Deformity follows which is by far greater and

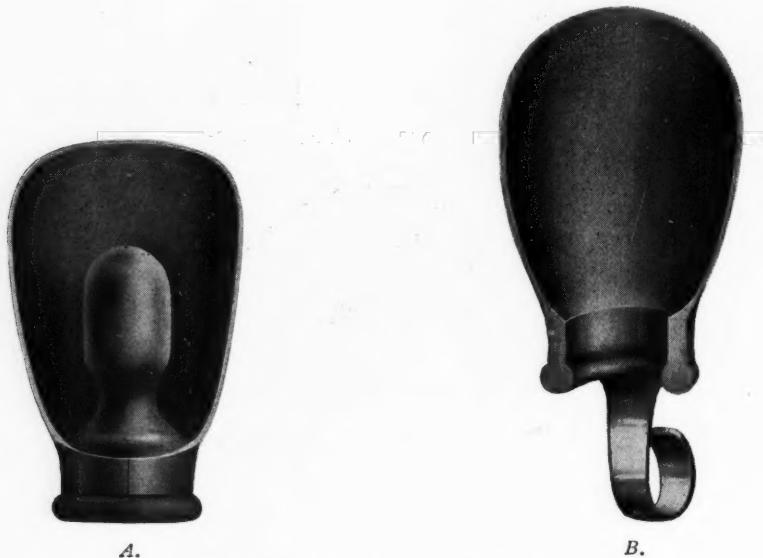


Fig. 5.—Brophy nipple. *A.* For bottle. *B.* For breast feeding.

more difficult to repair than that originally presented. It is in fact, a calamity which cannot be repaired.

With the excision of the premaxillary bones go the tooth germs, and the child is forever missing temporary as well as permanent teeth. They must be put back into position to form a normal arch.

Operations performed in early infancy afford the best results, yet very successful operations may be made at almost any time in life.

It cannot be too frequently repeated that the first undertaking should be the closure of the cleft of the bones, because herein lies the success of subsequent operations. With proper surgical principles and technic, the normal physiologic functions of the palate are restored.

It seems to be almost useless to endeavor to outline the steps of this work in detail, as it is a physical impossibility to get surgery from books or papers. It

must be gained by assisting or carefully watching the work done many, many times, the same as any and all other surgical procedures. The many complications encountered in this field try the ingenuity and patience of the surgeon to the very utmost.

Certain definite steps must be carried out to give the child a flexible, resilient palate. A specially designed periosteal elevator, known as the Brophy periosteal elevator, should be used to perfectly separate the soft tissue from its attachments. Great care is necessary in the very initial step of passing through the muscular mucosa down to the periosteum in the process of lifting the soft tissue. It should be freed all along the posterior border of the horizontal plates of the palate bones, extending down and back of the hamular process on either side. Very rarely is this accomplished in cleft palate surgery.

When the horsehair coaptation sutures are placed, no tension can be allowed or sloughing will follow and the operation result in failure. It is necessary at this time to place tension sutures of silver wire supported by lead plates to prevent tension on the horsehair sutures, as described above.

In this operation postoperative care is most essential. Isolation of bacteria being impossible, it is necessary to carefully irrigate the parts after each feeding, and in some cases half a dozen times a day. When it is impossible to isolate an organism, it must be combatted by other means, and in this instance constant irrigation is considered one of the laws of success.

In the last two operations, namely, the lip nostril and the soft palate, great care should be exercised not to traumatize the tissue more than it is necessary, as sloughing, particularly in the soft palate, is apt to follow.

Lateral incisions in the soft palate should never be made, (they are unnecessary), because in so doing, the tensor palati muscle and nerve are very likely to be severed, and once severed, do not unite. Following in the wake of this unfortunate procedure is deafness, owing to the fact that by traction in the act of swallowing and speaking the tensor palati muscle dilates the pharyngeal orifice of the eustachian tube.

Permanent sutures left in the mouth at the completion of any of these operations should be silver wire, lead plates and horsehair, for the reason that they do not absorb the saliva which is constantly contaminated with different forms of bacterial life. Older cases are not complete until speech training has been initiated.

It occurs to me in connection with this paper that it would not come amiss to say a few words relative to the preparation of young men for this work in our medical colleges. It is a rare exception to find a medical college wherein the students enjoy the privilege of having this subject properly presented to them. It is my opinion that no surgeon will question the advisability of having this subject taught by men who are specially trained in this line of surgery. Also I think no one will question the fact that we will have fewer unhappy results if this subject is given the thought to which it is entitled.

I believe that in the field of medicine and surgery a new era is dawning. With greater preparation it seems but logical to infer that altruism in the minds of a greater number of men will be practised.

I hope that no one, in or out of a medical college, student or teacher, will

take the foregoing remarks, in any manner as personal. They are only intended in the light of constructive criticism to the advancement of this class of surgery through better preparation.

In closing, it seems to me that the following quotation from Emerson is most fitting:

"I wish more to be a benefactor and servant than you wish to be served by me: and surely the greatest good fortune that could befall me is precisely to be so moved by you that I should say, take me and all mine, and use me and mine freely to your ends: for I would not say it otherwise than because a great enlargement had come to my heart and mind which made me superior to my fortunes. Nothing shall warp me from the belief that every man is a lover of truth."

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Overbite. J. H. Badcock. *The Dental Record*, 1920, xl, No. 9, p. 570.

The most successful method for the treatment of overbite in the form of postnormal occlusion, with no point of contact between the lower incisors and the upper incisors, is probably that of the biting plate in the upper jaw, which impinges on the lower incisors exclusively. This allows all the back teeth to lengthen together, so that when the plate is taken out the strain is distributed among them all, instead of being taken by one or two. It has the further advantage of depressing the lower incisors. If in conjunction with it an arch is used going round the upper incisors, the tendency which it otherwise would have, to force them further forward than they already are, is counteracted; and if to that arch little hooks are added which hook over the incisive edges of the upper teeth, one is able not only to lengthen the back teeth and shorten the lower incisors, but to shorten the upper incisors too. Experience has taught the author that it is not always necessary to open the bite before beginning to treat such cases. Some cases were treated by him by the extraction method without opening the bite.

Plastic Work in Surgery of the Jaw. George V. I. Brown. *Wisconsin Medical Journal*, 1920, xix, No. 4, p. 143.

Surgical judgment based on practical experience during the war has brought definite conclusions with regard to the selection of operative procedures that could not have been otherwise acquired in many years of ordinary practice. The principles which should govern the selection of a method for plastic, facial, or maxillary reconstruction are as follows: The form of overlying facial soft tissues is necessarily dependent upon the underlying bony framework. When the form of the jaw outline cannot be restored by bone grafts or cartilage transplants, then a suitable artificial appliance should be placed so that this form may be restored, and the soft parts moulded to fit over these surfaces, and held in suitable form thereby after operation if necessary. No tissue or other anatomical structure should ever be transposed or transplanted unless it be apparent that it is absolutely impossible to close the defect by the aid of adjoining struc-

tures. The nearer the operator can come to restoring normal functional activity by the correct alignment and attachment of the muscles of the affected part, the greater will be the certainty of good cosmetic result with continuance of improvement as time goes on. When anatomic integrity is violated by the introduction of foreign tissues or mal-muscular attachments, the effect will not be so good and unsightliness will usually become more and more apparent as time goes on. These rules according to the author's belief form the basis of all the governing influences that affect operations for harelip, cleft palate, and similar congenital defects, and they are just as true when the deformities are due to war or other injuries.

The success of subsequent corrective treatment is dependent upon the observation of certain principles immediately at the time of the injury. For example, the loss of a portion of the horizontal body of the mandible presents the alternative of forcing the fragments apart in order to bring the teeth into normal occlusion, in which case only a fibrous union must result, and a bone graft be required later on unless a permanent prosthetic appliance is worn continuously, or the drawing forward of the ramus to permit of its being attached to the end of the remaining jaw without regard for the disarrangement of the occlusion of the teeth. Both these methods have been strongly advocated, and both have been quite extensively employed. Basing judgment on the results as shown by many cases treated by both methods in the overseas hospitals that came under the author's observation after their return, it appears to be safe to conclude that each one of these methods of treatment has its advantages and both have disadvantages which should be avoided as much as possible. Approximation of the remaining portion of the body of the mandible to the ramus, and fixation by suture, provides the advantage of immediate healing and consequent relief for the patient, also in those cases in which there is considerable disarrangement of the occlusion of the opposite sides of the jaw. The disarranged tooth occlusion is apt to undergo a certain improvement as the result of a very considerable readjustment on the part of the ramus.

Etiology, Symptoms and Treatment of Alveolar Pyorrhea. Sebba. Zahnärztliche Rundschau, June 29, 1920, xxix, 26.

The author refers first to the *Spirochaeta pyorrhoica* of Kolle as the alleged cause of this affection. Study of the modern literature of pyorrhea leads to confusion as to what is really in the minds of the authors, although the original syndrome was clear and simple. The view that the affection can be caused by the spirochete in question is both premature and false. During 1919 Beyer endeavored to revolutionize our old conception of the affection. He tried to visualize a spirochetosis of different degrees beginning with gingivitis, including ulcerous stomatitis and Vincent's angina and ending in alveolar pyorrhea and noma. According to him each disease can be evolved from one of the other forms. Thus either a gingivitis or ulcerous stomatitis can become a pyorrhea. This the author disputes while conceding that a pyorrhea often begins with gingivitis. The spirochetes and fusiform bacilli of Vincent are found in so great a variety of disease that they cannot be looked upon as the pathogenic agent

in all, but rather as indicating often a secondary infection, or as having no significance at all. Beyer is very confusing concerning the mode of origin of pyorrhea from stomatitis ulcerosa. He claims that as a result of pocket formation due to destruction of the circular ligament the tooth loosens and falls out. But only in rare cases is pyorrhea preceded by ulcerous stomatitis. The latter condition was fearfully prevalent during the war yet no corresponding accumulated incidence of pyorrhea was seen. Further statements by both Beyer and Clemm concerning the symptoms of pyorrhea are not in accord with the experience of most dentists. This latter is as follows: pyorrhea begins insidiously; the alveolar border and circular ligament disappear and are replaced by granulation masses between the gum and alveolar margin. As a result of these, the affected teeth slowly loosen. The granulations constantly discharge pus while concrements form on the teeth beneath the gum line. The gums later become spongy and bleed easily. Fever, ulceration, severe pain, and sequestrum formation do not occur. Neither the cause nor the development nor symptoms as stated by Beyer have any counterpart in the clinic, nor is the process influenced by spirocheticides like salvarsan, although this may be a specific for true Vincent's diseases.

Leucoplasia Buccalis. Scervini. La Riforma Stomatologica, 1920, ii, 2.

The author concludes his study as follows: we are still uncertain of the intimate nature of this condition despite all of the clinical and histological work which is being constantly devoted to the subject. There are as hitherto two aspects of the problem which chiefly mystify us. One, of course, refers to the influence of syphilis in the genesis of these lesions, while the other deals with the effects of tobacco. At one time the profession believed fully in a special nicotinic type of these lesions in which tobacco was *per se* able to give rise to the latter. Of late years we have learned that nicotine is able to cause a patchy degeneration of the walls of the larger arteries, but it is a far cry to a belief that tobacco can give rise to these mucous lesions as a result in part of absorption. Is there any necessary connection between simple long continued irritation of the mucosæ and the appearance of these leucoplastic areas? Histology should throw some light on the nature of the lesions and it is by no means certain that it has had its last say on this subject. Is it possible to distinguish by the clinic and microscope between a syphilitic leucoplasia and a nonsyphilitic type? The author's own experience leads him to believe that the affection is the result of an infection or intoxication and that it is seen by preference in the arthritic. It is also seen in the neurasthenic. It is clinically a polymorphous manifestation, but the toxi-infectious theory is broad enough to embrace both the syphilitic and nicotinic cases even if the latter causes act only as determining or contributory factors.

Infected Apices of Teeth; Pyorrhea Alveolaris. Westlake. Medical Record, July 10, 1920, cxviii, 2.

The author opposes promiscuous extraction which threatens to displace to a greater or less extent the conservative procedures of apicoectomy, ionization, high frequency, etc. Thanks to conduction anesthesia, these resources had been

robbed of their terrors. In one session it has become possible to extirpate surgically the pulp, and fill the root, leaving the permanent crown filling for a second session when convenient. The author laid the foundation of dental electrotherapeutics in 1892 in a paper on cataphoresis and now upholds the contention that ionization destroys germ activity by coagulating the protein of the microorganisms in the infected apices and bone sinuses. Concerning radiology he does not believe that small dark points at the apices imply the power to cause constitutional disorders. The infected area must become definitely circumscribed and show coagulation-necrosis in order to indicate the possibility of systemic infection. Suppose the body resistance to be lowered from some cause, with the development of an arthritis or neuritis: if in such a case a tooth is not actually throbbing or sensitive to percussion it is hardly reasonable to accuse it as a primary cause. In one month of 1919 the author saw 117 cases of pulpitis, periostitis, and periodontitis, and only 15 failed to respond to treatment: these required 4 extractions and 11 root resections. Under pyorrhea the author mentions as remote prodromes in young men and women a red line on the gum margin—the period of latency may reach to 15 years. In 32 years of experience the author has found hardly any exception to the rule that in pyorrhea there are constipation and the presumption of autointoxication. The author's article is rich in statements based on extensive personal experience and should be read in the original.

War Injuries of the Jaws and Their Treatment. T. Jackson. The Dental Record, 1920, xl, No. 9, p. 562.

A special hospital for war injuries of the face and jaws was formed at Sidcup, in 1917, a unique one of its kind in that its staff was composed of Australian, Canadian, New Zealand, and British Officers, supplemented at one time by a large colony of Americans—a true intercolonial hospital. Each section was complete in itself, surgeons, medical officers, anesthetists, dentists and nursing service. The dental profession was prepared for the simpler type of maxillary and mandibular injury, but in war experience the injuries naturally became much more complicated, and expert radiographical service with special experience of jaw injuries was required for the rendering of a correct diagnosis as the basis for proper treatment. In no branch of the work is close cooperation between surgeon and dentist more desirable than in the treatment of the more severe types of maxillary injuries. No tissues, hard or soft, must be wasted. In the treatment of fractures of the mandible, no vital portion of bone should be removed. Great success has resulted from simple moulding of multiple fragments into position and retaining them by means of a combination of an external chin-piece and an intraoral splint. With regard to extraction of teeth in the treatment of mandibular fractures, the author points out that the great aim is to obtain osseous union and a good functional result, and no teeth should be saved whose presence militates against this aim. Displacement of the posterior fragment, meaning the portion behind the last remaining tooth, is usually associated with a deviation of the larger fragment toward the side of fracture. Extraction of upper molars, or even partial excision of the tuberosity of the maxilla, has been practised for the control of the resulting deformity.

Plastic Operations on the Mandible. E. Warkalla. *Beitrage zur Klinischen Chirurgie*, 1919, cvi, p. 356.

Among 41 cases of pseudarthrosis in general, 11 cases concerned the mandible, according to the author's observations; this relative frequency being due to the following factors: (1) Tendency to fracture of the mandible, on account of great friability of the brittle bone, which is poor in spongiosa. (2) Invariable infection from the buccal cavity. (3) Difficulty of absolute rest and fixation of the bone. (4) Apposition of the fractured ends is not permissible, even in small defects, in the interest of function. For the removal of pseudarthrosis, bony suture does not enter into consideration, and pedunculated plastic procedures are only rarely applicable. The method of choice is free autoplastic bone-transplantation. In the author's cases, the graft was always taken from the clavicle, except in two instances. This procedure affords the following advantages: (1) The clavicle furnishes sufficient material also for large defects, unless very thick segments of bone are required. (2) The grafts fit ideally into the defect, on account of their natural curvature. (3) Their removal is never injurious, as was sometimes observed with the removal of large wedges from the tibia. (4) The removal is very convenient, the graft being taken from the vicinity of the field of operation, so that this site can be included in the anesthetic zone. (5) The patients may get up as soon as the first day after the operation. A preliminary requirement for the performance of a plastic operation is the completion of all necessary interventions on soft parts, such as removal of all fistulas or foreign bodies, plastic procedures on the lips, and so forth. After all wounds have completely healed, at least four weeks must be allowed to elapse before the performance of the plastic operation. The site of the pseudarthrosis is exposed by a curved incision. The graft has a thickness of only two to three mm. and a width of five to seven mm. Fixation with simple soft parts sutures was found to be sufficient. In all aseptic cases, firm consolidation took place; the largest defect was 6 cm. long. The eleven cases include only one complete failure, due to infection; in nine cases, the operation proved highly successful. The certainty of success in plastic operations on the lower jaw is dependent upon (1) the avoidance of infection, and (2) the reliability of fixation. Infection is most reliably guarded against by a simple technic requiring only a short time. Fixation is best accomplished by strapping of the upper and lower jaw.

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EDITORIALS

The Boston Session of the National Dental Association

THE Twenty-fourth Annual Session of the National Dental Association was held in Boston, August 23-27, 1920. From the report of this session as given in the *Journal of the National Dental Association*, the meetings were a great success. The editorial in the above journal states that the session was a great meeting and is now a matter of history. We agree with the latter statement, but beg to amend the interpretation of the first.

From the standpoint of numbers present, membership, etc., the meeting might truthfully be said to have been the “biggest and best.” The amount of money collected for various purposes and the advancement toward a permanent fund for the support of the *Journal of the National Dental Association*, all point to the interest manifested by the profession as a whole in the National Dental Association. Activities in the House of Delegates would tend to prove that the

Association existed for a purpose, even though the purpose might be the settling of whether "whiskey and brandy should be in the United States Pharmacopeia.

From the standpoint of the ordinary member, we do not believe that the success of a meeting can be judged by the activities in the House of Delegates or the amount of money collected by the secretary. Neither can success from a scientific standpoint be judged by these things. After the average man admits everything that the secretary calls attention to, and when he considers some of the things that were more evident in the meeting than the workings of the House of Delegates, he will be forced to the conclusion that the meeting was radically different from "the biggest and best," and will say, as we have heard many say, "This meeting is the worst I have ever attended." Yes, the Boston meeting, from the standpoint of the average member, was the worst we have ever seen, and we have seen several. Some of us who attended the New Orleans meeting thought things were about as bad as they could be. We heard several say at that meeting that they would never attend another, and, while conditions at New Orleans and Boston were not exactly alike, we prefer New Orleans.

Unless the meetings are planned differently in the future, they will not be representative of the dental profession. Very few men will attend year after year if they do not get more out of the meetings than they did at Boston. The sessions will be made up of men from the territory in which they are held.

From information gained from section officers of the Association, we understand it is now difficult to get men to give papers. At New Orleans essayists complained that they could not get audiences. There seemed to be a tendency in the minds of some at New Orleans that the Association was drifting into an organization that was more of a social affair than one given over to scientific research and the consideration of subjects of interest to dentistry. While the social activities were not made so prominent in Boston, it is safe to say that the scientific and practical sides of dentistry did not receive proper consideration. This was not exactly the fault of the officers of the Association, but was because the meeting was planned without taking into consideration the fact that it was to be the "biggest and best" from the point of numbers; for it was the large attendance that ruined it, to a certain extent, as a scientific session.

A mistake was made in trying to hold all the sections in one building that was in no way suited for such a purpose. It would have been an ideal place for a political convention or Elks' Carnival, but for a meeting place for sections of a scientific organization, it was out of the question and impossible. Instead of having properly equipped and separate rooms for each section as advertised by the advance press notices, the majority of the rooms were simply hallways that had been partitioned off by canvas and screens. The temporary partitions probably made a good appearance before the committee when six or eight people were in the building, but when a large number was present, so much noise and confusion could be heard through the various rooms that it was practically impossible to hear a paper read. It was also impossible to properly darken a room for the use of the stereopticon. The arrangements were so poor that one chairman refused to call his section to order amid the confusion, while other sections had to change rooms in order to hold their meetings at all. It sounds big to send out information that all sections of the National Dental Association will be

held in one building; but the sad experience in Boston proved the fallacy of such a belief.

Another poor arrangement at the Boston meeting was the prominence given the dental dealers' and manufacturers' exhibit. In fact, it appeared that the Boston meeting was planned especially for the dental supply houses. We believe that the exhibits should be far enough away from the section meetings not to interfere with the scientific purposes of the organization. In Boston the entire lower floor of the building was given over to the commercial men while the upper floor was used for the Association meetings; and every one who attended the scientific sessions or clinics was compelled to go through the section of exhibits. We have no grievance against dental supply men, and we believe if they are charged for space at the National Dental Association meetings, they should be given some time. However, as much as the dental supply man is a necessity, we believe he does not belong at the National Dental Association meetings or any other dental meeting. The National Dental Association is large enough not to have to be dependent upon exhibitors for money. If we are mistaken in this, we still contend that something must be done to keep the Association from becoming a side attraction to the dental exhibit.

It has been previously mentioned that it is becoming difficult to get men to read papers before the National Dental Association, and this difficulty will increase unless more attention is given to the scientific sections. No one is going to try to listen to a paper amid such noise and confusion as existed at the Boston meeting. We hope that officers of the Association will profit by the mistakes of the Boston meeting, and not repeat the same thing at Milwaukee.

ORTHODONTIC NEWS AND NOTES

The editors desire to make this department a permanent feature of the Journal, but in order to do so must have the full support of the orthodontic profession throughout the country. We would deem it a great favor if our subscribers and readers would send in such announcements as might be of interest to the profession.

Glasgow Odontological Society—Session 1919-1920

The fourth meeting of the Session was held in the Dental Hospital on January 20th. Twenty-four members were present, and the President occupied the Chair.

The minutes of the previous meeting were read and approved.

Messrs. John Young Graham and John Crawford were duly elected to the membership of the Society.

There were no Casual Communications, and the President called on Captain Thomas Jackson to read his paper on "War Injuries of the Jaw and Their Treatment." (This paper will be abstracted in an early issue of this Journal.)

Captain Jackson illustrated his address with a large collection of lantern slides, some of them especially prepared for the occasion.

Notes of Interest

Dr. L. R. Sattler announces his location at 680 Brandeis Building, Omaha, Nebraska, where he will succeed Dr. W. E. Stoft in the practice of orthodontia.

Dr. Bernard G. DeVeries announces that he is now engaged in private practice at 933-934 Metropolitan Bank Building, Minneapolis, Minnesota. Practice limited to orthodontia.

Dr. C. H. Rangeley announces the opening of his offices, Suite 603-604, Medical Science Bldg., 1029 Vermont Ave., N. W., Washington D. C., for the exclusive practice of orthodontia.

Dr. Harry W. Wilson, formerly of the partnership, Drs. Hoffman and Wilson, announces the removal of his offices to Suite 606, Metropolitan Building, Denver. Practice limited to orthodontia.

Dr. W. T. Chapman announces the opening of his office at 505 Martin Building, El Paso, Texas. Practice limited to orthodontia.

Dr. H. B. Tileston, Jr., announces the removal of his office to Suite 719-720 Starks Building, Louisville, Ky. Practice limited to orthodontia.

Dr. E. Everett Voyles announces that from October 1, 1920, his practice will be limited to orthodontia. Offices removed to 808 Odd Fellow Building, Indianapolis, Ind.

Dr. W. J. Fitzpatrick, Miami, Florida, will limit his practice to orthodontia beginning November 1, 1920.

Dr. John A. McPhail announces the removal of his office to 408 Bell Block, Cincinnati, Ohio. Orthodontia exclusively.

Mrs. Katherine Stiles announces the marriage of her daughter, Eva Thelma, to Dr. Edward L. Mitchell, on Saturday, the third of July, 1920, Newport, Kentucky.

Dr. Charles H. Patton announces that after October 15, 1920, he will be associated with Dr. Samuel P. Cameron, 2011 Chestnut St., Philadelphia, Pa., where he will limit his practice to the care of children's teeth.